Supporting Information

A rational quest for selectivity through precise ligand-positioning in the tandem DNA-catalysed Friedel-Crafts alkylation/ asymmetric protonation

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I. General Information

Pyridine, DIEA and diisopropylamine were distilled over calcium hydride. THF was distilled over sodium/benzophenone. All reactions were performed in anhydrous conditions under argon. 4,4'-Dimethyl-2,2'-bipyrine, 5-ethynyl-2'deoxyuridine, 2'-propargyl-deoxyuridine and 2,2'-anydrodeoxyuridine were purchased from Alfa and Carbosynth. Phosphoramidite precursors were purchased from Eurogenetech.

Thin-layer chromatographies (TLC) were performed on silica plate 60 F254 Merck and the different spots were revealed under λ illumination at 254 nm. Silica gel purifications were carried out with 0.040-0.063 mm silica from Merck.

NMR experiments were accomplished on a Bruker DRX 600 spectrometer, 400 spectrometer or 300 spectrometer at 20 °C in $CDCl_3$. The ^1H NMR spectra are described as follow: chemical shifts expressed in δ (ppm) values (part per million) and internal standard of residual $CHCl_3$ was fixed at 7.26 ppm. Multiplicity (br = broad, s = singlet, d = doublet, t = triplet, q = quartet, quint. = quintuplet, m = multiplet), coupling constant *J* (Hz) and integration.

The syntheses of the oligonucleotides were performed on solid support using an automated DNA synthesizer (Applied Biosystems 394). Crude oligonucleotides were analysed by RP-HPLC (Macherey-Nagel Nucleodur C-18, 100 Å, 8 x 125 mm, Buffer A: 50 mM TEAAc in 0.2% CH_3CN, Buffer B: 50 mM TEEAc in 80% CH_3CN, 2 mL/min flow rate, detection at 260 nm) and purified by flash chromatography (interchim column PF-15C18HQ-F0025, 15 mL/min flow rate, detection at 260 nm and λ scan 200-600 nm). Oligonucleotides were desalted using a dialysis membrane Float-A-Lyzer G2 Dialysis Device CE, Biotech CE, 0.5-1.0 kD MWCO, 1 mL, and transferred to a 2 mL Eppendorf-vial and lyophilized from water.

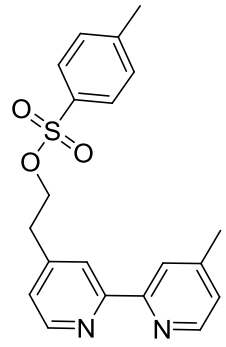
MALDI-TOF mass spectra were recorded on a Shimazu Alliance using 2,4,6-trihydroxyacetophenone as a saturated solution in a mixture of acetonitrile/0.1M ammonium citrate solution (1:1, v/v) for the matrix. Analytical samples were mixed with the matrix in a 1:5 (v/v) ratio, crystallized on a 100-well stainless steel plate and analysed.

*T*m experiments were performed on a Varian Cary 300 Bio λ/Visible spectrometer by measuring absorbance at 260 nm. Oligonucleotides were diluted in 20 mM cacodylate buffer with 100 mM NaCl.

All the ees were determined by HPLC using a chiral column (Chiralpak IA and IB). The sign before the ee values is arbitrarily attributed.

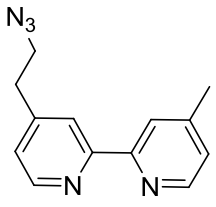
II. Synthesis of modified dmbipy and phosphoramidite

4-Methyl-4'-ethyltosylate-2,2'-bipyridine (3)



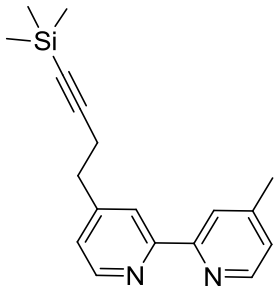
Under argon, a round-bottom flask was charged with 4-methyl-4'-hydroxyethyl-2,2'-bipyridine **2** synthetized as described in literature[1] (400 mg, 1.87 mmol), pyridine (1.30 mL, 14.9 mmol) in anhydrous dichloromethane (16.0 mL). The reaction was stirred overnight and after completion monitored by TLC, the mixture was diluted in 15.0 mL of ether. The organic phase was washed with 10.0 mL of water and neutralised with 10.0 mL of saturated $NaHCO_3$ solution. The aqueous phase was extracted with ether (3 x 20.0 mL) and the resulting organic layers were dried over anhydrous Na_2SO_4 and concentrated in vacuum. The crude product was purified by silica gel chromatography (0-100% EtOAc, cyclohexane, 4% of Et_3N) to afford product **3** as a yellow oil with 57% yield (255 mg, 1.07 mmol) R_f 0.40 (Cyclohexane EtOAc 3:7 with 4% Et_3N). **^{1}H NMR (300 MHz, $CDCl_3$)** δ 8.53 (t, *J* = 5.7 Hz, 2H), 8.24 (s, 1H), 8.15 (s, 1H), 7.71-7.61 (m, 2H), 7.21 (d, *J* = 8.0 Hz, 2H), 7.17 (dd, *J* = 5.0, 0.9 Hz, 1H), 7.10 (dd, *J* = 5.0, 1.7 Hz, 1H), 4.31 (t, *J* = 6.6 Hz, 2H), 3.03 (t, *J* = 6.6 Hz, 2H), 2.45 (s, 3H), 2.32 (s, 3H). **^{13}C NMR (75 MHz, $CDCl_3$)** δ 155.4, 154.8, 149.6, 149.3, 148.2, 147.0, 144.9, 132.6, 129.9, 128.9, 127.9, 126.1, 125.2, 124.7, 122.5, 121.8, 69.3, 34.9, 29.8, 21.6. **HRMS-ESI** *m/z* 369.1276 ($[M+H]^+$ $C_{20}H_{21}N_2O_3S$ calcd 369.1273).

4-Methyl-4'-azidoethyl-2,2'-bipyridine (4)



To a round-bottom flask filled with dry DMF (6.00 mL), was added 4-methyl-4'-ethyltosylate-2,2'-bipyridine **3** (230 mg, 0.63 mmol) and sodium azide (49.0 mg, 0.75 mmol). The reaction was stirred for 2 h at 0 °C. After total consumption of the starting material, the mixture was diluted in EtOAc (15.0 mL), washed with water (10.0 mL) and with a saturated NaCl solution. The aqueous phase was extracted with EtOAc (3 x 15.0 mL) and the organic layers were dried over anhydrous Na_2SO_4 before evaporation of solvent. The crude material was purified by silica gel chromatography (Cyclohexane/EtOAc 0-100%, 4% of Et_3N) to afford product **4** as a yellow oil with 85% yield (127 mg, 0.53 mmol) R_f 0.40 (Cyclohexane EtOAc 8:2 with 4% Et_3N). **^{1}H NMR (300 MHz, $CDCl_3$)** δ 8.57 (dd, *J* = 21.3, 4.5 Hz, 2H), 8.26 (d, *J* = 12.4 Hz, 2H), 7.16 (dd, *J* = 11.4, 4.6 Hz, 2H), 3.62 (t, *J* = 6.9 Hz, 2H), 2.97 (t, *J* = 7.0 Hz, 2H), 2.44 (s, 3H). **^{13}C NMR (75 MHz, $CDCl_3$)** δ 156.6, 155.7, 149.4, 149.0, 148.4, 148.2, 125.0, 124.2, 122.2, 121.5, 51.4, 35.0, 21.3. **HRMS-ESI** *m/z* 240.1253 ($[M+H]^+$ $C_{13}H_{14}N_5$ calcd 240.1249).

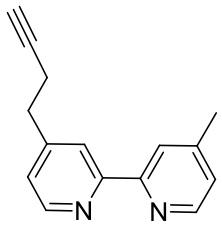
4-Methyl-4'-(4"-(trimethylsilyl)-but-3"-inyl)-2,2'-bipyridine (5)



To a solution of diisopropylamine (1.40 mL, 8.00 mmol) in dry THF (6.70 mL) was added dropwise a solution of *n*-BuLi (1.80 M solution in hexane, 1.70 mL, 3.00 mmol) and the reaction mixture was stirred for 30 min at –78 °C. Commercially available 2,2'-dimethyl-4,4'-bipyridine **1** (1.00 g, 5.5 mmol) in dry THF (40.0 mL) was added dropwise and the black mixture was stirred for another 2 h. Trimethylsilylpropargyl bromide (2.00 mL, 12.2 mmol) in dry THF (33.0 mL) was added dropwise and stirred for 1 h at –78 °C, and then allowed to reach room temperature in 1 h. The colour of anion disappeared, and the mixture turned yellow. The excess LDA was quenched with water

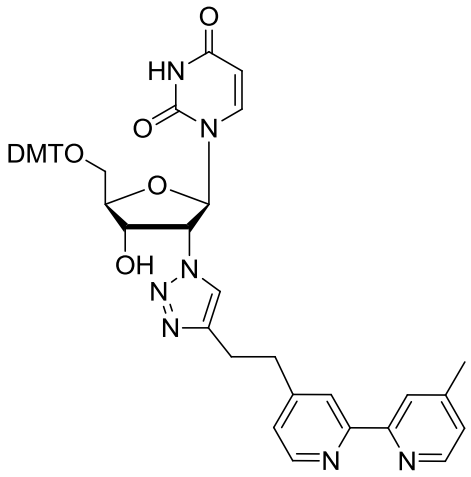
(20.0 mL) and the aqueous phase was extracted with EtOAc (3 × 30.0 ml). The organics layers were washed with brine (10.0 mL) and dried over magnesium sulphate. Evaporation of the solvent gave an orange oil which was purified on reverse phase silica gel column chromatography with water/acetonitrile (0-100%) to afford **5** as a white powder with 46% yield (736 mg, 2.50 mmol). R_f 0.20 (H_2O Acetonitrile 5:5). **^{1}H NMR (300 MHz, $CDCl_3$)** δ 8.54 (dd, *J* = 15.1, 5.0 Hz, 2H), 8.24 (d, *J* = 16.2 Hz, 2H), 7.26-7.10 (m, 2H), 2.89 (t, *J* = 7.3 Hz, 2H), 2.57 (t, *J* = 7.3 Hz, 2H), 2.42 (s, 3H), 0.11 (m, 9H). **^{13}C NMR (75 MHz, $CDCl_3$)** δ 156.3, 156.0, 150.4, 149.0, 149.0, 148.2, 124.7, 124.1, 122.0, 121.5, 105.6, 86.2, 53.5, 34.4, 21.2, 21.1, 0.1. **HRMS-ESI** *m/z* 295.1630 ($[M+H]^+$ $C_{18}H_{24}N_2Si$ calcd 295.1631).

4-Methyl-4'-(but-3"-inyl)-2,2'-bipyridine (6)



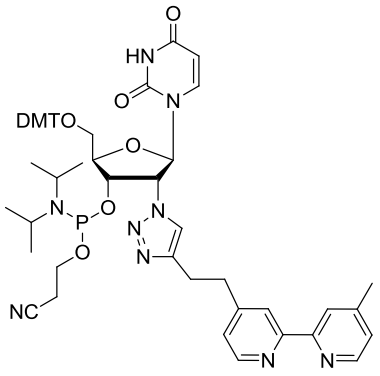
To a stirred solution of trimethylsilyl-protected compound **5** (700 mg, 2.37 mmol) in CH_3OH/THF (1:1) was added KF (700 mg, 12.0 mmol) as a solid. After complete consumption of the starting material (ca. 20 h), the solution was concentrated in vacuum. Dichloromethane was added to the white crude product and the resulting solution was filtered through silica gel. The solvent was evaporated to afford compound **6** as a white solid powder with 98% yield (515 mg, 2.32 mmol) R_f 0.39 (Cyclohexane/EtOAc = 9:1 with 4% Et_3N). **^{1}H NMR (300 MHz, $CDCl_3$)** δ 8.57 (dd, *J* = 16.5, 5.0 Hz, 2H), 8.27 (d, *J* = 12.8 Hz, 2H), 7.23-7.14 (m, 2H), 2.93 (t, *J* = 7.4 Hz, 2H), 2.58 (td, *J* = 7.4, 2.6 Hz, 2H), 2.44 (s, 3H), 1.98 (t, *J* = 2.6 Hz, 1H). **^{13}C NMR (75 MHz, $CDCl_3$)** δ 156.3, 155.8, 150.3, 149.2, 148.9, 148.4, 124.8, 123.9, 122.2, 121.3, 82.9, 69.6, 34.3, 21.3, 19.5. **HRMS-ESI** *m/z* 223.1235 ($[M+H]^+$ $C_{15}H_{15}N_2$ calcd 223.1235).

5′-*O*-(4,4′-Dimethoxytrityl)-2′-Deoxy-2′-(4'-ethyl-(4-méthyl-2,2'-bipyririne)-1,2,3-triazol-1-yl) uridine (14)



In a degassed solution of THF:H_2O:pyridine (6:3:2, 20.0 mL) under argon, 2'-Azido-5'-*O*-(4,4'-dimethoxytrityl)-2'-deoxyuridine **13** synthetized as described in the literature (990 mg, 1.73 mmol), and 4-methyl-4'-(4"-(trimethylsilyl)-but-3"-inyl)-2,2'-bipyridine **6** (500 mg, 2.25 mmol) were dissolved. A degassed solution of sodium ascorbate (139 mg, 0.69 mmol) and $CuSO_4 \cdot 5H_2O$ (86 mg, 0.35 mmol) in water (3.00 mL) was added, and the reaction mixture was stirred at room temperature for 30 min. The reaction mixture was concentrated to 2 mL and then diluted with CH_2Cl_2 (40.0 mL), and the mixture was washed with a saturated aqueous solution of $NaHCO_3$ (20.0 mL). The aqueous phase was extracted with CH_2Cl_2 (3 × 20.0 mL) and the combined organic phases were dried under anhydrous Na_2SO_4. The resulting organic phase was concentrated to obtain a crude yellow oil which was purified by silica gel column chromatography: Cyclohexane-EtOAc (0-100%) and EtOAc-MeOH (0-50%) with 4% Et_3N to afford the product **14** as a yellow foam with 69% yield (882 mg, 1.19 mmol). R_f 0.30 (EtOAc with 4% Et_3N). **^{1}H NMR (300 MHz, $CDCl_3$)** δ 8.57 (d, *J* = 4.9 Hz, 1H), 8.25-8.09 (m, 2H), 7.75 (d, *J* = 8.2 Hz, 1H), 7.67 (s, 1H), 7.47 (s, 1H), 7.40 (d, *J* = 7.2 Hz, 2H), 7.35-7.17 (m, 11H), 7.03 (d, *J* = 4.6 Hz, 1H), 6.84 (d, *J* = 8.6 Hz, 4H), 6.58 (d, *J* = 7.4 Hz, 1H), 5.45 (d, *J* = 8.2 Hz, 1H), 5.36-5.19 (m, 1H), 4.66-4.50 (m, 1H), 4.43 (d, *J* = 2.8 Hz, 1H), 3.78 (s, 6H), 3.56 (qd, *J* = 11.0, 2.8 Hz, 2H), 3.32-2.87 (m, 4H), 2.43 (s, 3H), 2.00 (s, 1H). **^{13}C NMR (101 MHz, $CDCl_3$)** δ 162.5, 158.9, 156.3, 155.1, 150.8, 150.3, 149.6, 149.4, 147.9, 145.8, 144.2, 139.3, 135.2, 135.1, 130.2, 128.2, 127.3, 124.9, 124.6, 123.5, 123.5, 113.5, 103.4, 87.5, 85.6, 71.0, 65.9, 63.0, 55.4, 35.6, 34.6, 29.8, 26.9, 21.3, 14.9. **HRMS-ESI** m/z 794.3303 ($[M+H]^+$ $C_{45}H_{45}N_7O_7$ calcd 794.3302).

3′-*O*-(2-Cyanoethoxy(diisopropylamino)phosphinyl))-5′-O-(4,4′-dimethoxytrityl)-2′-Deoxy-2′-(4’-ethyl-(4-méthyl-2,2’-bipyririne)-1,2,3-triazol-1-yl)uridine (15)



Under argon, diisopropylethylamine (0.70 mL, 3.21 mmol) was added to a solution of **14** (850 mg, 1.07 mmol) in dry CH_2Cl_2 (20.0 mL). Then 2-cyanoethyl-*N*,*N*-diisopropylchlorophosphoramidite (954 mg, 4.28 mmol) was added. After stirring for 2 h at room temperature, EtOAc previously washed with saturated aqueous $NaHCO_3$ solution was added (50.0 mL) and the reaction mixture was washed with 30.0 mL of solution NaCl/$NaHCO_3$ (1/1 v/v). The aqueous phase was extracted with EtOAc (3 x 20.0 mL) and the organic layer was dried over Na_2SO_4 and concentrated under reduced pressure. The crude product was purified by silica gel column chromatography with cyclohexane-EtOAc (0-100%) and EtOAc-MeOH (0-50%) containing 10% Et_3N. The desired phosphoramidite **15** was obtained as white foam with 84% yield (883 mg, 0.89 mmol). R_f = 0.45 (4% MeOH in EtOAc with adding of 10% Et_3N). **^{1}H NMR (300 MHz, $CDCl_3$)** δ 8.64-8.45 (m, 2H), 8.31-8.15 (m, 2H), 7.89 (dd, *J* = 42.0, 8.2 Hz, 1H), 7.60 (s, 1H), 7.42 (d, *J* = 7.8 Hz, 2H), 7.37-7.20 (m, 9H), 7.16 (dd, *J* = 17.4, 4.1 Hz, 2H), 6.85 (t, *J* = 6.7 Hz, 4H), 6.47 (dd, *J* = 41.6, 5.1 Hz, 1H), 5.64-5.25 (m, 2H), 5.03-4.50 (m, 2H), 3.79 (d, *J* = 2.7 Hz, 6H), 3.75-3.14 (m, 7H), 3.14-3.00 (m, 6H), 2.59 (t, *J* = 5.9 Hz, 1H), 2.43 (s, 3H), 2.06-1.93 (m, 7H), 1.39-1.21 (m, 6H), 1.17-0.97 (m, 7H), 0.90 (dd, *J* = 13.3, 6.7 Hz, 6H). **^{31}P NMR (121 MHz, $CDCl_3$)** δ 151.57, 150.39. **^{13}C NMR (126 MHz, $CDCl_3$)** δ 175.1, 163.2, 162.7, 158.9, 158.8, 158.8, 156.4, 156.0, 156.0, 151.2, 151.2, 150.4, 150.3, 149.3, 149.3, 149.0, 148.3, 146.4, 146.0, 144.2, 144.1, 139.7, 139.2, 135.2, 135.0, 130.3, 130.2, 128.3, 128.2, 128.1, 127.4, 127.2, 124.8, 124.0, 123.9, 123.6, 122.6, 122.3, 122.2, 121.4, 121.4, 118.0, 117.4, 113.5, 113.4, 103.3, 102.6, 88.1, 87.5, 87.2, 85.8, 84.8, 72.6, 72.5, 70.9, 70.7, 66.2, 62.4, 60.8, 58.1, 57.9, 57.9, 57.8, 55.4, 55.3, 46.8, 46.8, 45.5, 43.3, 43.3, 35.2, 35.0, 29.8, 26.6, 26.4, 26.4, 24.6, 24.5, 24.4, 24.4, 23.0, 22.6, 21.6, 21.3, 20.6, 20.5, 20.4, 20.3, 19.3, 19.3, 14.9, 8.6, 2.0. **HRMS-ESI** *m/z* 994.4381 ([M+H]+ $C_{54}H_{61}N_9O_8P$ calcd 994.4381).

III. DNA sequences

a. Synthesis

1. Post-synthetic approach

Commercial phosphoramidites **7** and **10** were incorporated with 5 min time coupling (0.1 M) to synthetize **ODN1** and **ODN2**. After synthesis of these modified oligonucleotide bearing an alkyne function, CPG beads were washed with a 0.2 M solution of sodium bisulfite (3 x 1 mL), water (3 x 2 mL), anhydrous acetonitrile (3 × 2 mL) and then dried by nitrogen flushing. To the solid-supported oligonucleotide (1 µmol) were added azido dmbipy **4** (2 equiv, 2 µmol, 20 µL of a 0.1 M solution in dioxane), freshly prepared $CuSO_4$ (1 equiv, 1 µmol, 25 µL of a 0.04 M solution in degassed H_2O), freshly prepared sodium ascorbate (5 equiv, 5 µmol, 50 µL of a 0.1 M solution in degassed H_2O), THPTA (3 equiv, 3 µmol, 30 µL of a 0.1 M solution), and dioxane (20 µL). The resulting preparation was treated with microwave for 1h30 in a sealed vessel. The solution was removed by filtration, and the CPG beads were washed with dioxane, water, saturated EDTA acid solution, water, and acetonitrile (2 mL each).

2. Phosphoramidite approach

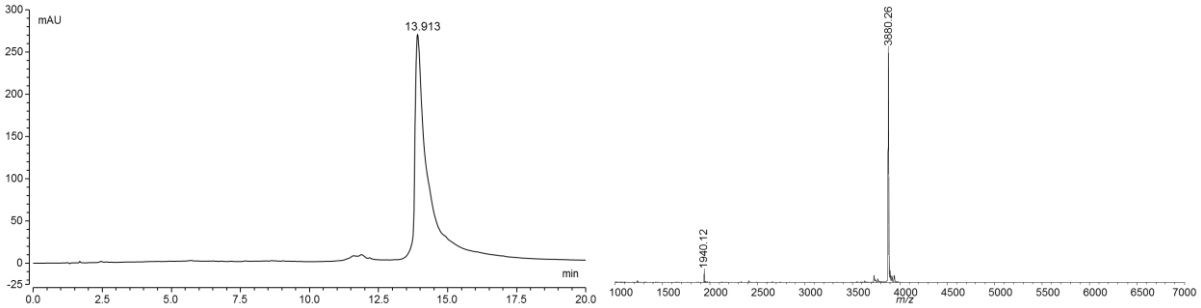
Commercial phosphoramidites **7** and **10** were incorporated with 5 min simple coupling (0.1 M) to synthetize **ODN1** and **ODN2**.

Modified phosphoramidite **15** was incorporated with 2 x 20 min time coupling (0.2M) to synthesize **ODN3**.

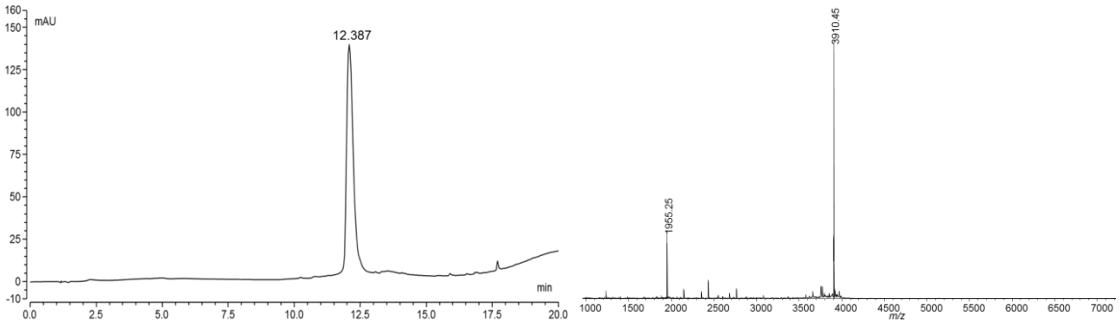
b. HPLC and Mass Analysis

Entry	Name	Calcd	Found
1	**ODN1**	3880.81	3880.26
2	**ODN2**	3910.29	3910.45
3	**ODN3**	3880.81	3881.22
4	**ODN4**	3661.37	3661.93
5	**ODN5**	3630.13	3630.42

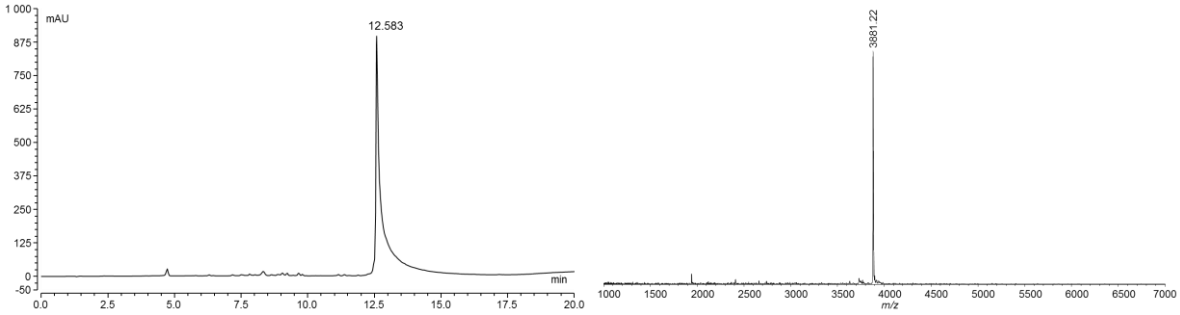
1. ODN1



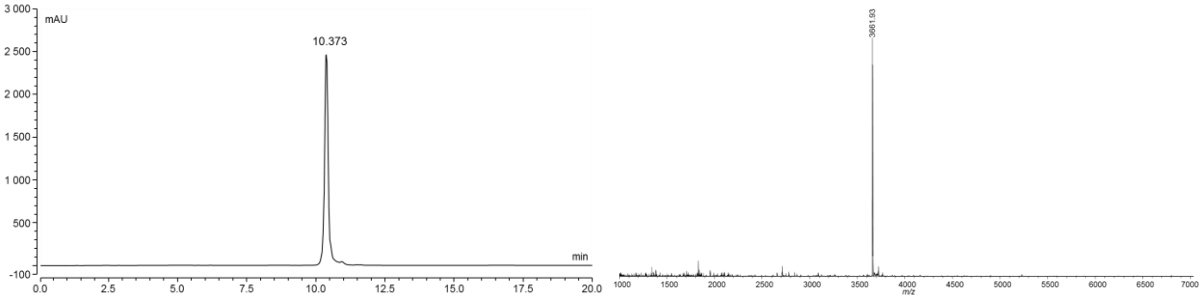
2. ODN2



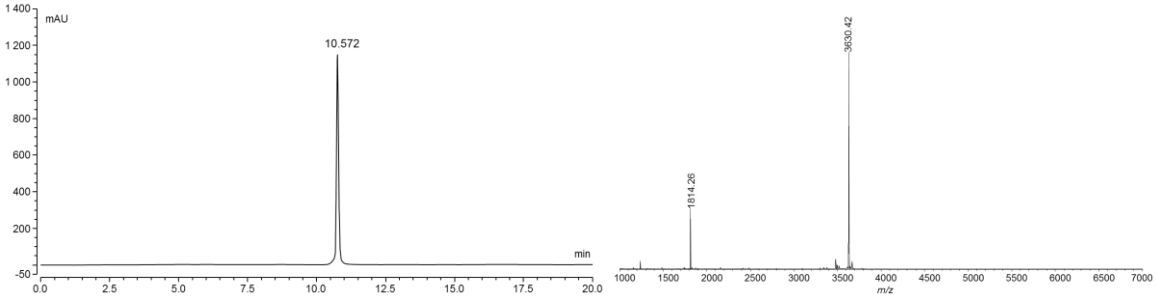
3. ODN3



4. ODN4



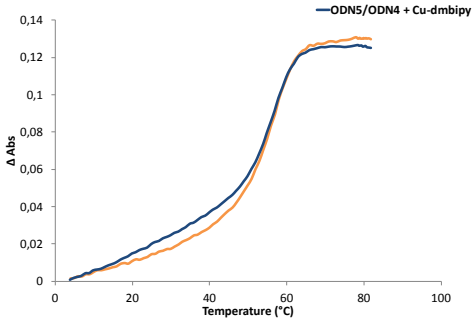
5. ODN5



c. Melting temperature

1. *ODN5/ODN4*

a)



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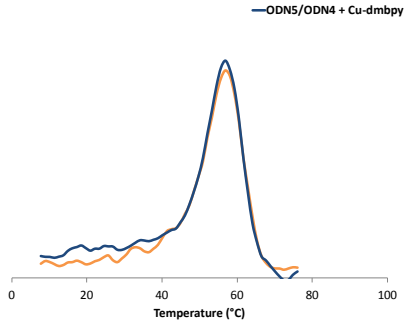
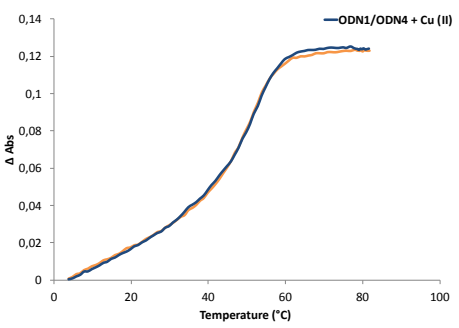


2. *ODN1/ODN4*

c)



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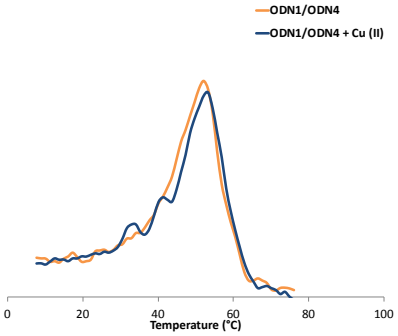
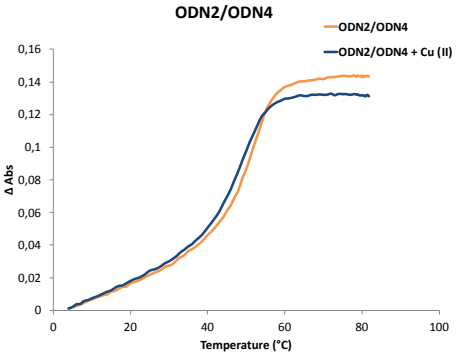


3. *ODN2/ODN4*

e)



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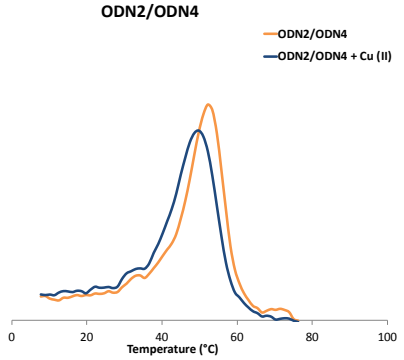
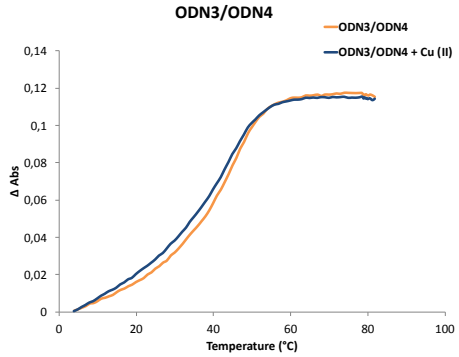
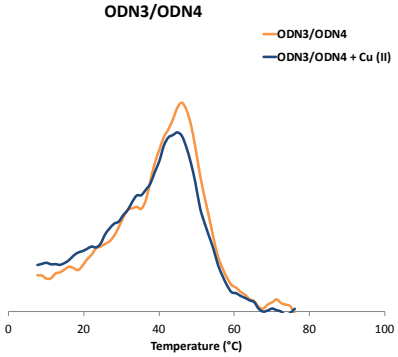


4. *ODN3/ODN4*

g)



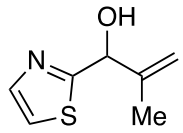
h)



IV. Friedel-Crafts alkylation/protonation

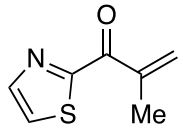
a. Synthesis of starting materials

2-Methyl-1-(thiazol-2-yl)prop-2-en-1-ol



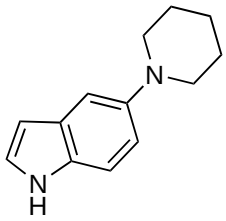
2-(Trimethysilyl)triazole (1.60 mL, 10.0 mmol, 1.00 equiv.) and methacrolein (0.82 mL, 10.0 mmol, 1.00 equiv.) were stirred at room temperature for 4 h. The mixture was then diluted in THF (200 mL) and tetrabutylammonium fluoride solution 1.0 M in THF (10.0 mL, 10.0 mmol, 1.00 equiv.) was added. After additional stirring for 1 h, the solvent was removed under vacuum and the crude residue was dissolved in EtOAc and washed with a saturated aqueous solution of $NaHCO_3$. The crude reaction mixture was purified by flash column chromatography over silica gel (PE/EtOAc, from 100:0 to 80:20) to afford the desired alcohol as a yellow oil, with 50% yield (776 mg, 5.00 mmol). ^{1}H NMR and ^{13}C NMR spectra matched those reported in the literature.[3]

2-Methyl-1-(thiazol-2-yl)prop-2-en-1-one (16)



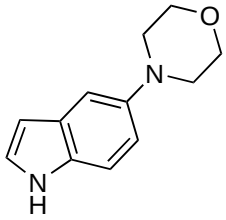
2-Methyl-1-(thiazol-2-yl)prop-2-en-1-ol (100 mg, 0.64 mmol, 1.00 equiv.) was dissolved in dichloromethane (3.50 mL) and MnO_2 (576 mg, 6.40 mmol, 10.0 equiv.) was added to the solution. The mixture was stirred at room temperature for 1.5 h. After completion of the reaction monitored by TLC (PE/EtOAc, 70:30), the crude was filtered over Celite© and the solvent was removed under vacuum. The product was obtained as colourless oil with 87% yield (85.3 mg, 0.56 mmol) and was used on the same day without further purification. ^{1}H NMR and ^{13}C NMR spectra matched those reported in the literature.[3]

5-(Piperidin-1-yl)-1*H*-indole (17m)



In an oven-dried tube, Pd_2dba_3 (9.10 mg, 0.01 mmol, 1.00 mol%), 2-diclyclohexylphosphino-2'-(*N*,*N*-dimethylamino)biphenyl (9.40 mg, 0.024 mmol, 2.40 mol%) and 5-bromoindole (196 mg, 1.00 mmol, 1.00 equiv.) were dissolved in THF (1.00 mL). LiHMDS solution 1.0 M in THF (2.20 mL, 2.20 mmol, 2.20 equiv.) and morpholine (105 μL, 1.20 mmol, 1.20 equiv.) were slowly added to the solution, which was stirred at 65 °C overnight. After cooling down at room temperature, HCl 1M (2.00 mL) was added and the mixture was stirred for additional 15 min. The crude was diluted with a saturated aqueous solution of $NaHCO_3$, and extracted with EtOAc. The combined organic phases were washed with brine, dried over $MgSO_4$ and concentrated under vacuum. The crude was purified by flash column chromatography over silica gel (PE/EtOAc, from 100:0 to 125:75) to afford the desired compound as a brown oil with 75% yield (150 mg, 0.75 mmol). ^{1}H NMR and ^{13}C NMR spectra matched those reported in the literature.[3]

4-(1*H*-Indol-5-yl)morpholine (17n)



In an oven-dried tube, Pd_2dba_3 (9.10 mg, 0.01 mmol, 1.00 mol%), 2-diclyclohexylphosphino-2'-(*N*,*N*-dimethylamino)biphenyl (9.40 mg, 0.024 mmol, 2.40 mol%) and 5-bromoindole (196 mg, 1.00 mmol, 1.00 equiv.) were dissolved in THF (1.00 mL). LiHMDS solution 1.0 M in THF (2.20 mL, 2.20 mmol, 2.20 equiv.) and morpholine (105 μL, 1.20 mmol, 1.20 equiv.) were slowly added to the solution, which was stirred at 65 °C overnight. After cooling down at room temperature, HCl 1M (2.00 mL) was added and the mixture was stirred for additional 15 min. The crude was diluted with a saturated aqueous solution of $NaHCO_3$, and extracted with EtOAc. The combined organic phases were washed with brine, dried over $MgSO_4$ and concentrated under vacuum. The crude residue was purified by flash column chromatography over silica gel (PE/EtOAc, from 100:0 to 125:75) to afford the desired compound as a brown oil with 70% yield (142 mg, 0.70 mmol). ^{1}H NMR and ^{13}C NMR spectra matched those reported in the literature.[4]

b. Preparation of racemic products

In an oven-dried tube, $Cu(NO_3)_2.3H_2O$ (6.30 mg, 0.026 mmol, 10 mol%) and 4,4'-dimethyl-2,2'-bipyridyl (dmbipy, 5.70 mg, 0.03 mmol, 12 mol%) were dissolved in acetonitrile (2.00 mL). The mixture was stirred for 10 min and a solution of enone (**16)** (40.0 mg, 0.26 mmol, 1.00 equiv.) and the desired indole (0.39 mmol, 1.50 equiv.) in acetonitrile (2.00 mL) was added. The mixture was stirred at room temperature for 3 d. The solvent was removed under vacuum and the crude residue was purified by flash column chromatography over silica gel (*n*-Hexanes/EtOAc) to afford the desired compound.

c. Procedure of enantioselective Friedel-Crafts alkylation/protonation

1. Preparation of a 200 mM MES buffer (pH 5.0)

3-(*N*-Morpholino)ethanesulfonic acid (2.13 g, 10.0 mmol) was dissolved in Milli-Q H_2O (40.0 mL). The pH was adjusted to 5.0 using a pH meter with a NaOH solution 0.1 M. The volume was finally adjusted with MilliQ-H_2O to 50 mL.

2. Preparation of a 0.90 mM $Cu(NO_3)_2$.dmbipy stock solution

$Cu(NO_3)_2$•$3H_2O$ (4.80 mg, 0.02 mmol, 1.00 equiv.) and 4,4'-dimethyl-2,2'-bipyridyl (dmbipy, 4.40 mg, 0.024 mmol, 1.20 equiv.) were dissolved in 22.2 mL of Milli-Q H_2O. The mixture was stirred at room temperature for 5 h and used in the next step without further purification.

3. Preparation of a 1.00 mM $Cu(NO_3)_2$ stock solution

$Cu(NO_3)_2$•$3H_2O$ (4.80 mg, 0.02 mmol, 1.00 equiv.) was dissolved in 20.0 mL of Milli-Q H_2O. The mixture was stirred at room temperature for 1 h and used the next day.

4. General procedure A. Enantioselective Friedel-Crafts alkylation/protonation, supramolecular approach with st-DNA

St-DNA solution (29.0 μL, stock solution 4.5 mg/mL or 6.92 mM (bp) in Milli-Q H_2O, 2 mM final concentration) and Milli-Q H_2O (23.7 μL) were successively added to a 500 μL Eppendorf tube. The reaction mixture was briefly mixed. MES buffer solution (10.0 μL, stock solution 200 mM in Milli-Q

H_2O, pH 5.0, 1/10 V_{tot}) and $Cu(NO_3)_2$.dmbipy solution (33.3 μL, stock solution 0.90 mM in Milli-Q H_2O prepared 24 h in advance, 30.0 mol%) were then added. The resulting mixture was stirred at 19 °C for 20 min and frozen at –20 °C for 30 min. Freshly prepared enone (**16)** (2.00 μL, stock solution 0.05 M in DMSO, 0.10 μmol, 1.00 equiv.) was added and the mixture was frozen again at –20 °C for 30 min. Desired indole (2.00 μL, stock solution 0.05 M in DMSO, 0.10 μmol, 1.00 equiv.) was finally added in a cold room. The resulting solution was stirred at 4 °C for 3 d in a thermoshaker placed in a cold room. The mixture was then transferred into 1.5 mL Eppendorf tube. The initial Eppendorf tube was rinsed with H_2O (100 μL) and diethyl ether (100 μL). Additional diethyl ether (400 μL) was finally added. After stirring, the tube was placed in dry ice to freeze H_2O. The etheral phase was poured into a new 1.5 mL Eppendorf tube. The process was repeated twice (2 x 500 μL diethyl ether). After evaporation of diethyl ether, the sample was dissolved in *i*-PrOH (2 x 50 μL), transferred in an HPLC mini vial and injected to measure both the conversion and the *ee*.

5. General procedure B. Enantioselective Friedel-Crafts alkylation/protonation, supramolecular approach with ODN5/ODN4 duplex.

Strand solution **ODN5** (21.8 μL, stock solution 1838 nmol/mL in Milli-Q H_2O, 40.0 mol%), counter strand solution **ODN4** (15.4 μL stock solution 2599 nmol/mL in Milli-Q H_2O, 40.0 mol%) and Milli-Q H_2O (15.5 μL) were successively added to a 500 μL Eppendorf tube. The reaction mixture was briefly mixed, heated at 90 °C for 5 min and allowed to cool down at room temperature. MES buffer solution (10.0 μL, stock solution 200 mM in Milli-Q H_2O, pH 5.0, 1/10 V_{tot}) and $Cu(NO_3)_2$.dmbipy solution (33.3 μL, stock solution 0.90 mM in Milli-Q H_2O prepared 24 h in advance, 30.0 mol%) were then added. The resulting mixture was stirred at 19 °C for 20 min and frozen at –20 °C for 30 min. Freshly prepared enone (**16)** (2.00 μL, stock solution 0.05 M in DMSO, 0.10 μmol, 1.00 equiv.) was added and the mixture was frozen again at –20 °C for 30 min. Desired indole (2.00 μL, stock solution 0.05 M in DMSO, 0.10 μmol, 1.00 equiv.) was finally added in a cold room. The resulting solution was stirred at 4 °C for 3 d in a thermoshaker placed in a cold room. The mixture was then transferred into 1.5 mL Eppendorf tube. The initial Eppendorf tube was rinsed with H_2O (100 μL) and diethyl ether (100 μL). Additional diethyl ether (400 μL) was finally added. After stirring, the tube was placed in dry ice to freeze H_2O. The etheral phase was poured into a new 1.5 mL Eppendorf tube. The process was repeated twice (2 x 500 μL diethyl ether). After evaporation of diethyl ether, the sample was dissolved in *i*-PrOH (2 x 50 μL), transferred in an HPLC mini vial and injected to measure both the conversion and the *ee*.

6. General procedure C. Enantioselective Friedel-Crafts alkylation/protonation, covalent approach with ODN1/ODN4 duplex.

Strand solution **ODN1** (18.7 μL, stock solution 2136 nmol/mL in Milli-Q H_2O, 40.0 mol%), counter strand solution **ODN4** (15.4 μL stock solution 2599 nmol/mL in Milli-Q H_2O, 40.0 mol%) and Milli-Q H_2O (21.9 μL) were successively added to a 500 μL Eppendorf tube. The reaction mixture was briefly mixed, heated at 90 °C for 5 min and allowed to cool down at room temperature. MES buffer solution (10.0 μL, stock solution 200 mM in Milli-Q H_2O, pH 5.0, 1/10 V_{tot}) and $Cu(NO_3)_2$ solution (30.0 μL, stock solution 1.00 mM in Milli-Q H_2O, 30.0 mol%) were then added. The resulting mixture was stirred at 19 °C for 20 min and frozen at –20 °C for 30 min. Freshly prepared enone (**16)** (2.00 μL, stock solution 0.05 M in DMSO, 0.10 μmol, 1.00 equiv.) was added and the mixture was frozen again at –20 °C for 30 min. Desired indole (2.00 μL, stock solution 0.05 M in DMSO, 0.10 μmol, 1.00 equiv.) was finally added in a cold room. The resulting solution was stirred at 4 °C for 3 d in a thermoshaker placed in a cold room. The mixture was then transferred into 1.5 mL Eppendorf tube. The initial Eppendorf tube was rinsed with H_2O (100 μL) and diethyl ether (100 μL). Additional diethyl ether (400 μL) was finally added. After stirring, the tube was placed in dry ice to freeze H_2O. The etheral phase was poured into a new 1.5 mL Eppendorf tube. The process was repeated twice (2 x 500 μL diethyl ether). After evaporation of diethyl ether, the sample was dissolved in *i*-PrOH (2 x 50 μL), transferred in an HPLC mini vial and injected to measure both the conversion and the *ee*.

7. General procedure D. Enantioselective Friedel-Crafts alkylation/protonation, covalent approach with ODN2/ODN4 duplex.

Strand solution **ODN2** (34.7 μL, stock solution 1153 nmol/mL in Milli-Q H_2O, 40.0 mol%), counter strand solution **ODN4** (15.4 μL stock solution 2599 nmol/mL in Milli-Q H_2O, 40.0 mol%) and Milli-Q H_2O (5.90 μL) were successively added to a 500 μL Eppendorf tube. The reaction mixture was briefly mixed, heated at 90 °C for 5 min and allowed to cool down at room temperature. MES buffer solution (10.0 μL, stock solution 200 mM in Milli-Q H_2O, pH 5.0, 1/10 V_{tot}) and $Cu(NO_3)_2$ solution (30.0 μL, stock solution 1.00 mM in Milli-Q H_2O, 30.0 mol%) were then added. The resulting mixture was stirred at 19 °C for 20 min and frozen at –20 °C for 30 min. Freshly prepared enone (**16)** (2.00 μL, stock solution 0.05 M in DMSO, 0.10 μmol, 1.00 equiv.) was added and the mixture was frozen again at –20 °C for 30 min. Desired indole (2.00 μL, stock solution 0.05 M in DMSO, 0.10 μmol, 1.00 equiv.) was finally added in a cold room. The resulting solution was stirred at 4 °C for 3 d in a thermoshaker placed in a cold room. The mixture was then transferred into 1.5 mL Eppendorf tube. The initial Eppendorf tube was rinsed with H_2O (100 μL) and diethyl ether (100 μL). Additional diethyl ether (400 μL) was finally added. After stirring, the tube was placed in dry ice to freeze H_2O.

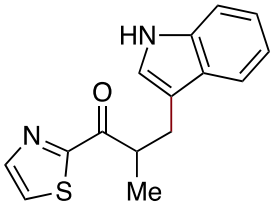
The etheral phase was poured into a new 1.5 mL Eppendorf tube. The process was repeated twice (2 x 500 μL diethyl ether). After evaporation of diethyl ether, the sample was dissolved in *i*-PrOH (2 x 50 μL), transferred in an HPLC mini vial and injected to measure both the conversion and the *ee*.

8. General procedure E. Enantioselective Friedel-Crafts alkylation/protonation, covalent approach with ODN3/ODN4 duplex.

Strand solution **ODN3** (50.2 μL, stock solution 797 nmol/mL in Milli-Q H_2O, 40.0 mol%) and counter strand solution **ODN4** (15.4 μL stock solution 2599 nmol/mL in Milli-Q H_2O, 40.0 mol%) successively added to a 500 μL Eppendorf tube. The reaction mixture was briefly mixed, heated at 90 °C for 5 min and allowed to cool down at room temperature. MES buffer solution (10.0 μL, stock solution 200 mM in Milli-Q H_2O, pH 5.0, 1/10 V_{tot}) and $Cu(NO_3)_2$ solution (30.0 μL, stock solution 1.00 mM in Milli-Q H_2O, 30.0 mol%) were then added. The resulting mixture was stirred at 19 °C for 20 min and frozen at –20 °C for 30 min. Freshly prepared enone (**16)** (2.00 μL, stock solution 0.05 M in DMSO, 0.10 μmol, 1.00 equiv.) was added and the mixture was frozen again at –20 °C for 30 min. Desired indole (2.00 μL, stock solution 0.05 M in DMSO, 0.10 μmol, 1.00 equiv.) was finally added in a cold room. The resulting solution was stirred at 4 °C for 3 d in a thermoshaker placed in a cold room. The mixture was then transferred into 1.5 mL Eppendorf tube. The initial Eppendorf tube was rinsed with H_2O (100 μL) and diethyl ether (100 μL). Additional diethyl ether (400 μL) was finally added. After stirring, the tube was placed in dry ice to freeze H_2O. The etheral phase was poured into a new 1.5 mL Eppendorf tube. The process was repeated twice (2 x 500 μL diethyl ether). After evaporation of diethyl ether, the sample was dissolved in *i*-PrOH (2 x 50 μL), transferred in an HPLC mini vial and injected to measure both the conversion and the *ee*.

d. NMR description of racemate products, HPLC methods and results of enantioselective protonation reactions

3-(1*H*-Indol-3-yl)-2-methyl-1-(thiazol-2-yl)propan-1-one (18a)



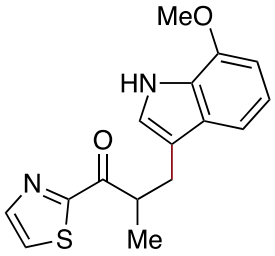
^{1}H NMR and ^{13}C NMR spectra matched those reported in the literature.[3]

HPLC: Chiralpak IA column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 97:3, 1 mL/min, λ = 280 nm, t_R = 44.430 min and t_R = 53.322 min.

Entry	General procedure	Sequences	Indole/Products[a]	ee (%)[a]
1	A	st-DNA	5 : 95	(+) 21
2	B	**ODN5/ODN4**	13 : 87	(+) 40
3	C	**ODN1/ODN4**	70 : 30	(–) 20
4	D	**ODN2/ODN4**	24 : 76	(–) 80
5	E	**ODN3/ODN4**	70 : 30	(+) 7

[a]Determined by HPLC.

3-(7-Methoxy-1*H*-indol-3-yl)-2-methyl-1-(thiazol-2-yl)propan-1-one (18b)



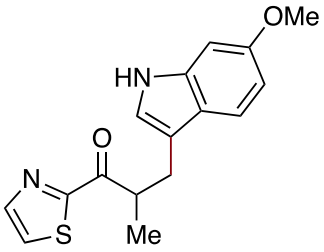
^{1}H NMR and ^{13}C NMR spectra matched those reported in the literature.[3]

HPLC: Chiralpak IB column, 100 bar, T = 20 °C, *n*-Heptane (+ 0.1% diethylamine)/EtOH (+ 0.1% diethylamine) = 95:5, 1 mL/min, λ = 300 nm, t_R = 23.083 min and t_R = 27.820 min.

Entry	General procedure	Sequences	Indole/Products[a]	ee (%)[a]
1	A	st-DNA	4 : 96	(+) 17
2	B	**ODN5/ODN4**	20 : 80	(+) 38
3	C	**ODN1/ODN4**	48 : 52	(–) 12
4	D	**ODN2/ODN4**	22 : 78	(–) 86
5	E	**ODN3/ODN4**	68 : 32	(–) 29

[a]Determined by HPLC.

3-(6-Methoxy-1*H*-indol-3-yl)-2-methyl-1-(thiazol-2-yl)propan-1-one (18c)



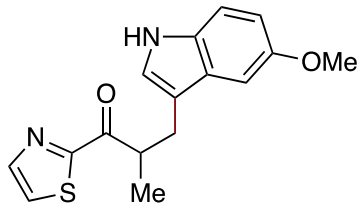
^{1}H NMR and ^{13}C NMR spectra matched those reported in the literature.[3]

HPLC: Chiralpak IA column, 100 bar, T = 25 °C, *n*-Heptane (+ 0.1% diethylamine)/EtOH (+ 0.1% diethylamine) = 95:5, 1 mL/min, λ = 300 nm, t_R = 33.767 min and t_R = 52.823 min.

Entry	General procedure	Sequences	Indole/Products[a]	ee (%)[a]
1	A	st-DNA	12 : 88	(+) 29
2	B	**ODN5/ODN4**	35 : 65	(+) 5
3	C	**ODN1/ODN4**	56 : 44	(–) 16
4	D	**ODN2/ODN4**	36 : 64	(–) 86
5	E	**ODN3/ODN4**	79 : 21	(–) 19

[a]Determined by HPLC.

3-(5-Methoxy-1*H*-indol-3-yl)-2-methyl-1-(thiazol-2-yl)propan-1-one (18d)



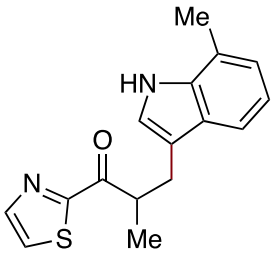
^{1}H NMR and ^{13}C NMR spectra matched those reported in the literature.[3]

HPLC: Chiralpak IA column, 100 bar, T = 20 °C, *n*-Heptane (+ 0.1% diethylamine)/EtOH (+ 0.1% diethylamine) = 95:5, 1 mL/min, λ = 300 nm, t_R = 24.167 min and t_R = 28.463 min.

Entry	General procedure	Sequences	Indole/Products[a]	ee (%)[a]
1	A	st-DNA	17 : 83	(+) 43
2	B	**ODN5/ODN4**	1 : 99	(+) 41
3	C	**ODN1/ODN4**	22 : 78	(–) 6
4	D	**ODN2/ODN4**	15 : 85	(–) 74
5	E	**ODN3/ODN4**	35 : 65	0

[a]Determined by HPLC.

2-Methyl-3-(7-methyl-1*H*-indol-3-yl)-1-(thiazol-2-yl)propan-1-one (18e)



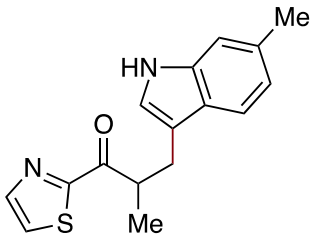
The racemic was isolated as a slightly yellow oil. R_f = 0.59 (PE/EtOAc 7:3). **^{1}H NMR (400 MHz, $CDCl_3$)** δ 8.02 (d, *J* = 3.0 Hz, 1H), 7.92 (br, -*NH*), 7.63 (d, *J* = 3.0 Hz, 1H), 7.61 (d, *J* = 7.8 Hz, 1H), 7.07 (t, *J* = 7.5 Hz, 1H), 7.02-6.97 (m, 2H), 4.30-4.21 (m, 1H), 3.40 (dd, *J* = 14.4, 6.3 Hz, 1H), 2.90 (dd, *J* = 14.4, 7.9 Hz, 1H), 2.46 (s, 3H), 1.31 (d, *J* = 6.9 Hz, 3H). **^{13}C NMR (100 MHz, $CDCl_3$)** δ 197.5, 167.1, 144.8, 135.9, 127.3, 126.3, 122.6, 122.4, 120.3, 119.7, 117.0, 114.4, 42.6, 29.0, 17.0, 16.7. **HRMS-ESI** *m/z*: calculated for $C_{16}H_{17}N_2OS$ $[M+H]^+$ 285. 1061. found 323.1063. IR (neat): 3411, 1676, 1388, 926, 733 cm^{-1}.

HPLC: Chiralpak IA column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 98:2, 1 mL/min, λ = 280 nm, t_R = 56.977 min and t_R = 66.383 min.

Entry	General procedure	Sequences	Indole/Products[a]	ee (%)[a]
1	A	st-DNA	8 : 92	(+) 11
2	B	**ODN5/ODN4**	8 : 92	(+) 37
3	C	**ODN1/ODN4**	75 : 25	(–) 14
4	D	**ODN2/ODN4**	12 : 88	(–) 82
5	E	**ODN3/ODN4**	74 : 26	(+) 8

[a]Determined by HPLC.

2-Methyl-3-(6-methyl-1*H*-indol-3-yl)-1-(thiazol-2-yl)propan-1-one (18f)



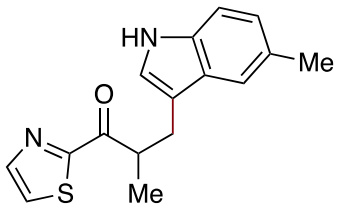
The racemic was isolated as a slightly yellow oil. R_f = 0.58 (PE/EtOAc 1:1). **^{1}H NMR (400 MHz, $CDCl_3$)** δ 8.02 (d, *J* = 3.0 Hz, 1H), 7.85 (br, 1H), 7.63 (d, *J* = 3.0 Hz, 1H), 7.61 (d, *J* = 8.0 Hz, 1H), 7.11 (br, 1H), 6.98 (dd, *J* = 8.0, 1.4 Hz, 1H), 6.93 (d, *J* = 2.3 Hz, 1H), 4.31-4.19 (m, 1H), 3.38 (dd, *J* = 14.3, 6.3 Hz, 1H), 2.88 (dd, *J* = 14.3, 7.9 Hz, 1H), 2.46 (s, 3H), 1.30 (d, *J* = 7.0 Hz, 3H). **^{13}C NMR (100 MHz, $CDCl_3$)** δ 197.6, 167.1, 144.8, 136.8, 131.8, 126.3, 125.6, 122.0, 121.2, 118.9, 113.7, 111.1, 42.6, 28.9, 21.8, 16.9. **HRMS-ESI** *m/z*: calculated for $C_{16}H_{17}N_2OS$ $[M+H]^+$ 285.1061. found 323.1063. IR (neat): 3406, 1677, 1453, 1388, 800, 734 cm^{-1}.

HPLC: Chiralpak IB column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 92:8, 1 mL/min, λ = 300 nm, t_R = 15.375 min and t_R = 19.436 min.

Entry	General procedure	Sequences	Indole/Products[a]	ee (%)[a]
1	A	st-DNA	5 : 95	(+) 36
2	B	**ODN5/ODN4**	1 : 99	(+) 36
3	C	**ODN1/ODN4**	56 : 44	(–) 14
4	D	**ODN2/ODN4**	1 : 99	(–) 73
5	E	**ODN3/ODN4**	58 : 42	(+) 13

[a]Determined by HPLC.

2-Methyl-3-(5-methyl-1*H*-indol-3-yl)-1-(thiazol-2-yl)propan-1-one (18g)



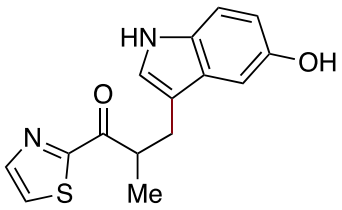
^{1}H NMR and ^{13}C NMR spectra matched those reported in the literature.[3]

HPLC: Chiralpak IA column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 97:3,1 mL/min, λ = 280 nm, t_R = 34.221 min and t_R = 44.000 min.

Entry	General procedure	Sequences	Indole/Products[a]	ee (%)[a]
1	A	st-DNA	1 : 99	(+) 43
2	B	**ODN5/ODN4**	10 : 90	(+) 43
3	C	**ODN1/ODN4**	54 : 46	(–) 4
4	D	**ODN2/ODN4**	19 : 81	(–) 67
5	E	**ODN3/ODN4**	50 : 50	(+) 20

[a]Determined by HPLC.

3-(5-Hydroxy-1*H*-indol-3-yl)-2-methyl-1-(thiazol-2-yl)propan-1-one (18h)



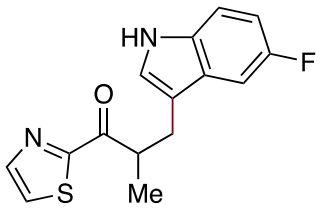
^{1}H NMR and ^{13}C NMR spectra matched those reported in the literature.[3]

HPLC: Chiralpak IA column, 250 bar, T = 25 °C, *n*-Heptane (+ 0.1% diethylamine)/EtOH (+ 0.1% diethylamine) = 90:10, 1 mL/min, λ = 300 nm, t_R = 29.340 min and t_R = 34.167 min.

Entry	General procedure	Sequences	Indole/Products[a]	ee (%)[a]
1	A	st-DNA	17 : 83	(+) 37
2	B	**ODN5/ODN4**	> 1 : 99	(+) 29
3	C	**ODN1/ODN4**	29 : 71	(–) 20
4	D	**ODN2/ODN4**	12 : 88	(–) 70
5	E	**ODN3/ODN4**	47 : 53	(–) 15

[a]Determined by HPLC.

3-(5-Fluoro-1*H*-indol-3-yl)-2-methyl-1-(thiazol-2-yl)propan-1-one (18i)



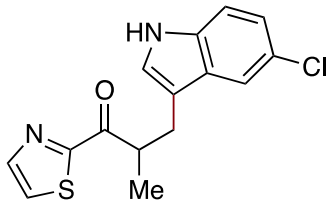
The racemic was isolated as a slightly yellow oil. R_f = 0.34 (PE/EtOAc 7:3). **^{1}H NMR (400 MHz, $CDCl_3$)** δ 8.03 (d, *J* = 3.1 Hz, 1H), 8.01 (s, 1H), 7.65 (d, *J* = 3.1 Hz, 1H), 7.39 (dd, *J* = 9.7, 2.5 Hz, 1H), 7.22 (dd, *J* = 9.7, 4.3 Hz, 1H), 7.04 (d, *J* = 2.4 Hz, 1H), 6.92 (td, *J* = 9.0, 2.5 Hz, 1H), 4.27-4.13 (m, 1H), 3.34 (dd, *J* = 14.4, 6.3 Hz, 1H), 2.84 (dd, *J* = 14.4, 7.9 Hz, 1H), 1.29 (d, *J* = 6.9 Hz, 3H). **^{13}C NMR (100 MHz, $CDCl_3$)** δ 197.3, 167.0, 157.9 (d, *J* = 234.3 Hz), 144.9, 132.8, 128.1 (d, *J* = 9.8 Hz), 126.4, 124.4, 114.1 (d, *J* = 4.8 Hz), 111.7 (d, *J* = 9.7 Hz), 110.4 (d, *J* = 26.5 Hz), 104.2 (d, *J* = 23.5 Hz), 42.5, 28.9, 16.8. **^{19}F NMR (377 MHz, $CDCl_3$)** δ –124.71. **HRMS-ESI** *m/z*: calculated for $C_{15}H_{13}FN_2OSNa$ $[M+Na]^+$ 307.0630. found 307.0554. IR (neat): 3410, 1678, 1485, 1389, 936 cm^{-1}.

HPLC: Chiralpak IA column, 250 bar, T = 30 °C, Hexane/*i*-PrOH = 97:3, 1 mL/min, λ = 280 nm, t_R = 45.925 min and t_R = 53.440 min.

Entry	General procedure	Sequences	Indole/Products[a]	ee (%)[a]
1	A	st-DNA	13 : 87	(+) 27
2	B	**ODN5/ODN4**	32 : 68	(+) 42
3	C	**ODN1/ODN4**	85 : 15	(–) 2
4	D	**ODN2/ODN4**	61 : 39	(–) 80
5	E	**ODN3/ODN4**	87 : 13	(+) 8

[a]Determined by HPLC.

3-(5-Chloro-1*H*-indol-3-yl)-2-methyl-1-(thiazol-2-yl)propan-1-one (18j)



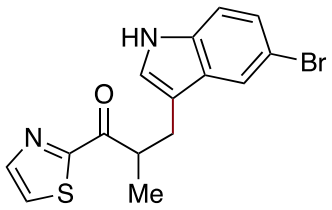
^{1}H NMR and ^{13}C NMR spectra matched those reported in the literature.[3]

HPLC: Chiralpak IA column, 250 bar, T = 20 °C, *n*-Heptane (+ 0.1% diethylamine)/EtOH (+ 0.1% diethylamine) = 97:3, 1 mL/min, λ = 300 nm, t_R = 26.413 min and t_R = 32.027 min.

Entry	General procedure	Sequences	Indole/Products[a]	ee (%)[a]
1	A	st-DNA	31 : 69	(+) 19
2	B	**ODN5/ODN4**	53 : 47	(+) 4
3	C	**ODN1/ODN4**	89 : 11	(+) 27
4	D	**ODN2/ODN4**	68 : 32	(–) 63
5	E	**ODN3/ODN4**	95 : 5	(+) 7

[a]Determined by HPLC.

3-(5-Bromo-1*H*-indol-3-yl)-2-methyl-1-(thiazol-2-yl)propan-1-one (18k)



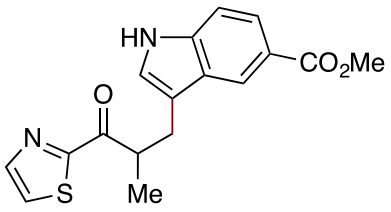
^{1}H NMR and ^{13}C NMR spectra matched those reported in the literature.[3]

HPLC: Chiralpak IA column, 250 bar, T = 20 °C, *n*-Heptane (+ 0.1% diethylamine)/EtOH (+ 0.1% diethylamine) = 97:3, 1 mL/min, λ = 300 nm, t_R = 27.153 min and t_R = 33.570 min.

Entry	General procedure	Sequences	Indole/Products[a]	ee (%)[a]
1	A	st-DNA	30 : 70	(+) 16
2	B	**ODN5/ODN4**	63 : 37	(+) 20
3	C	**ODN1/ODN4**	90 : 10	(+) 11
4	D	**ODN2/ODN4**	82 : 18	(–) 54
5	E	**ODN3/ODN4**	96 : 4	(+) 19

[a]Determined by HPLC.

Methyl 3-(2-methyl-3-oxo-3-(thiazol-2-yl)propyl)-1*H*-indole-5-carboxylate (18l)



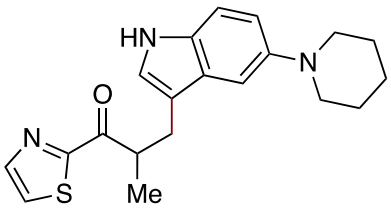
The racemic was isolated as a slightly yellow oil. R_f = 0.18 (PE/EtOAc 7:3). **^{1}H NMR (400 MHz, $CDCl_3$)** δ 8.56-8.51 (br, 1H), 8.36 (br, -*NH*), 8.02 (d, *J* = 3.0 Hz, 1H), 7.88 (dd, *J* = 8.5, 1.6 Hz, 1H), 7.64 (d, *J* = 3.0 Hz, 1H), 7.31 (d, *J* = 8.6 Hz, 1H), 7.05 (d, *J* = 2.2 Hz, 1H), 4.29-4.15 (m, 1H), 3.95 (s, 3H), 3.41 (dd, *J* = 14.5, 6.5 Hz, 1H), 2.93 (dd, *J* = 14.5, 7.5 Hz, 1H), 1.31 (d, *J* = 6.9 Hz, 3H). **^{13}C NMR (100 MHz, $CDCl_3$)** δ 197.3, 168.5, 166.8, 144.9, 138.9, 127.3, 126.4, 124.0, 123.4, 122.3, 121.4, 115.2, 110.9, 52.0, 42.7, 28.7, 16.9. **HRMS-ESI** *m/z*: calculated for $C_{17}H_{16}N_2O_3SNa$ $[M+Na]^+$ 351.0779. found 351.0762. **IR (neat)**: 3334, 1679, 1435, 1237, 747 cm^{-1}.

HPLC: Chiralpak IA column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 95:5, 1 mL/min, λ = 280 nm, t_R = 51.429 min and t_R = 57.744 min.

Entry	General procedure	Sequences	Indole/Products[a]	ee (%)[a]
1	A	st-DNA	57 : 43	(+) 23
2	B	**ODN5/ODN4**	76 : 24	(+) 24
3	C	**ODN1/ODN4**	traces	nd
4	D	**ODN2/ODN4**	91 : 9	(–) 49
5	E	**ODN3/ODN4**	traces	nd

[a]Determined by HPLC.

2-Methyl-3-(5-(piperidin-1-yl)-1*H*-indol-3-yl)-1-(thiazol-2-yl)propan-1-one (18m)



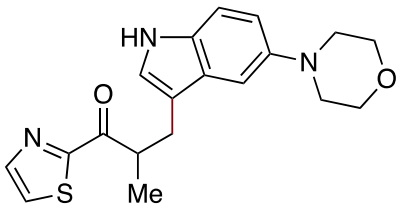
^{1}H NMR and ^{13}C NMR spectra matched those reported in the literature.[3]

HPLC: Chiralpak IB column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 92:8, 1 mL/min, λ = 300 nm, t_R = 27.286 min and t_R = 34.958 min.

Entry	General procedure	ODN	Indole/Products[a]	ee (%)[a]
1	A	st-DNA	5 : 95	(+) 72
2	B	**ODN5/ODN4**	16 : 84	(+) 72
3	C	**ODN1/ODN4**	traces	nd
4	D	**ODN2/ODN4**	53 : 47	(–) 67
5	E	**ODN3/ODN4**	traces	(+) 4

[a]Determined by HPLC.

2-Methyl-3-(5-morpholino-1*H*-indol-3-yl)-1-(thiazol-2-yl)propan-1-one (18n)



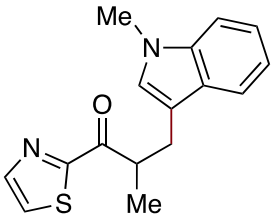
^{1}H NMR and ^{13}C NMR spectra matched those reported in the literature.[3]

HPLC: Chiralpak IA column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 90:10, 1 mL/min, λ = 280 nm, t_R = 29.559 min and t_R = 34.195 min.

Entry	General procedure	Sequences	Indole/Products[a]	ee (%)[a]
1	A	st-DNA	24 : 76	(+) 79
2	B	**ODN5/ODN4**	23 : 77	(+) 71
3	C	**ODN1/ODN4**	94 : 6	(+) 8
4	D	**ODN2/ODN4**	50 : 50	(–) 65
5	E	**ODN3/ODN4**	87 : 13	(+) 8

[a]Determined by HPLC.

2-Methyl-3-(1-methyl-1*H*-indol-3-yl)-1-(thiazol-2-yl)propan-1-one (18o)



^{1}H NMR and ^{13}C NMR spectra matched those reported in the literature.[3]

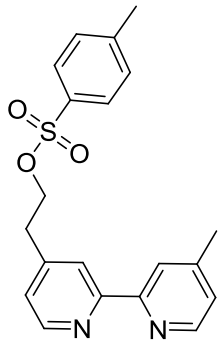
HPLC: Chiralpak IB column, 250 bar, T = 15 °C, *n*-Hexane/*i*-PrOH = 98:2, 0.8 mL/min, λ = 230 nm, t_R = 21.430 min and t_R = 25.843 min.

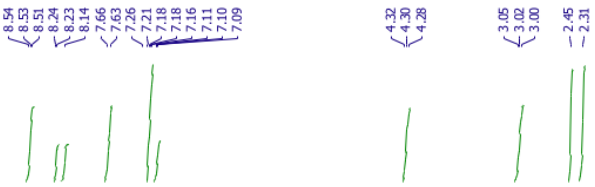
Entry	General procedure	Sequences	Indole/Products[a]	ee (%)[a]
1	A	st-DNA	> 1 : 99	(+) 3
2	B	**ODN5/ODN4**	> 1 : 99	(–) 36
3	C	**ODN1/ODN4**	traces	nd
4	D	**ODN2/ODN4**	> 1 : 99	(+) 61
5	E	**ODN3/ODN4**	traces	nd

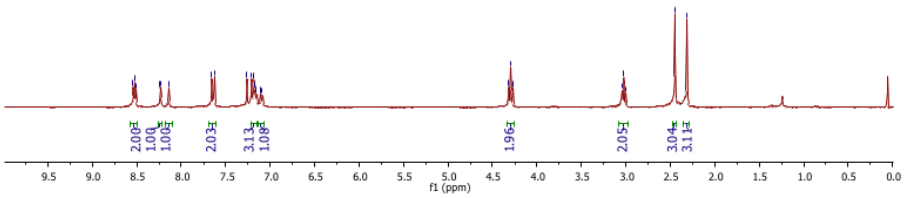
[a]Determined by HPLC.

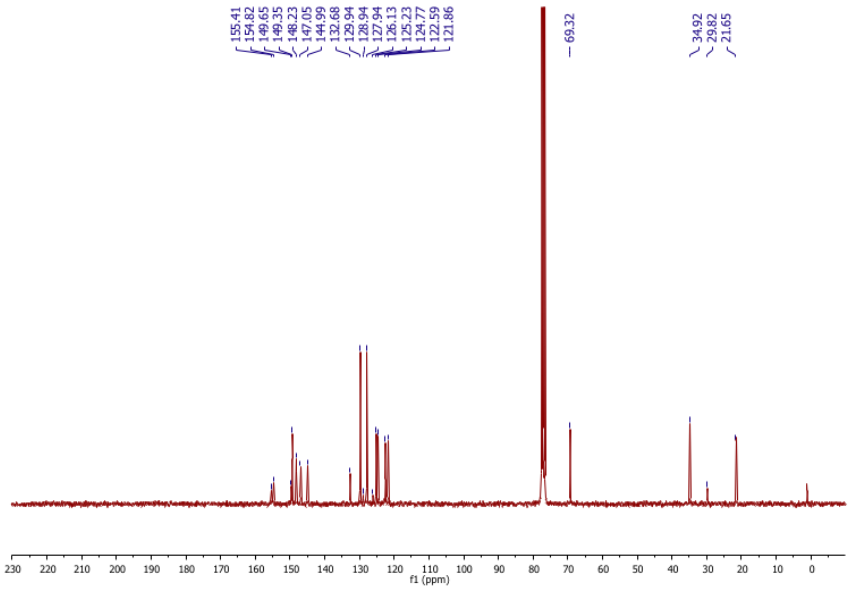
V. NMR of compounds

a. ^{1}H and ^{13}C NMR spectra for compound (3)

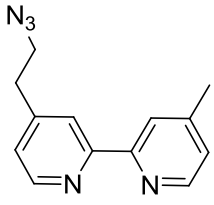


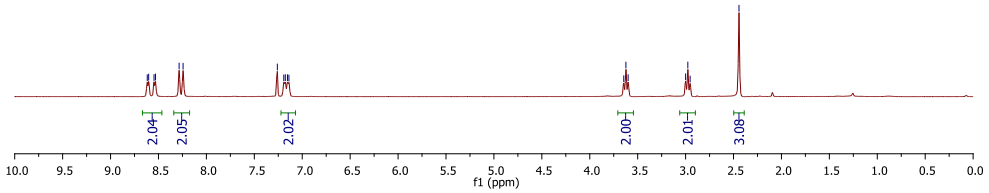


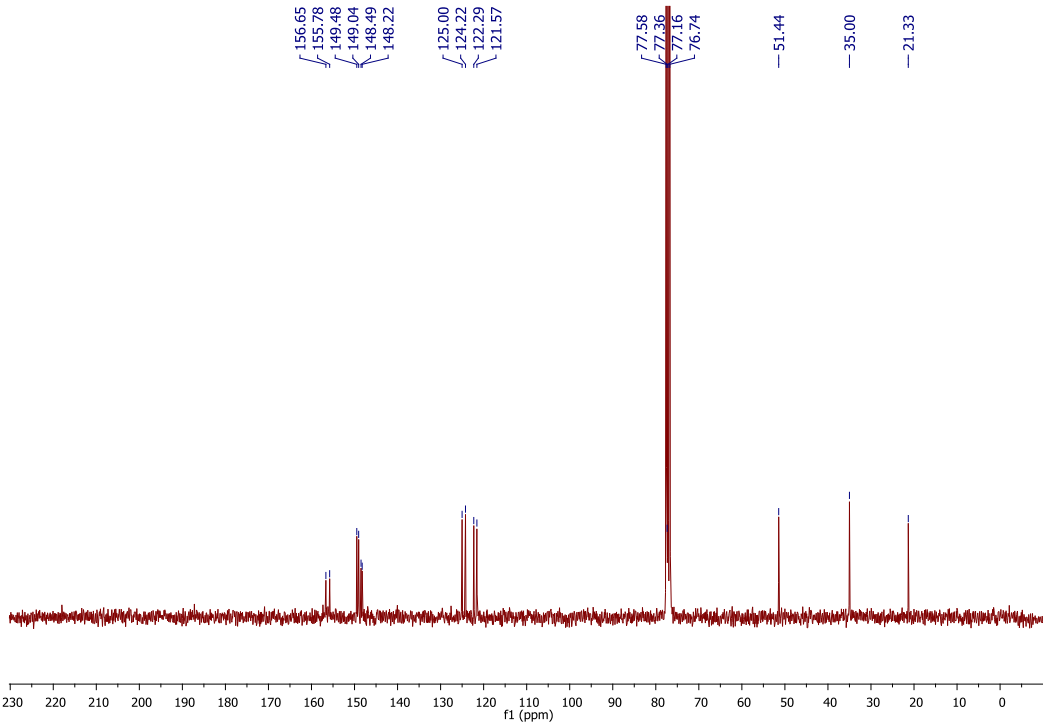




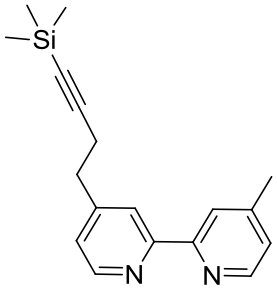
b. ^{1}H and ^{13}NMR spectra of compound (4)

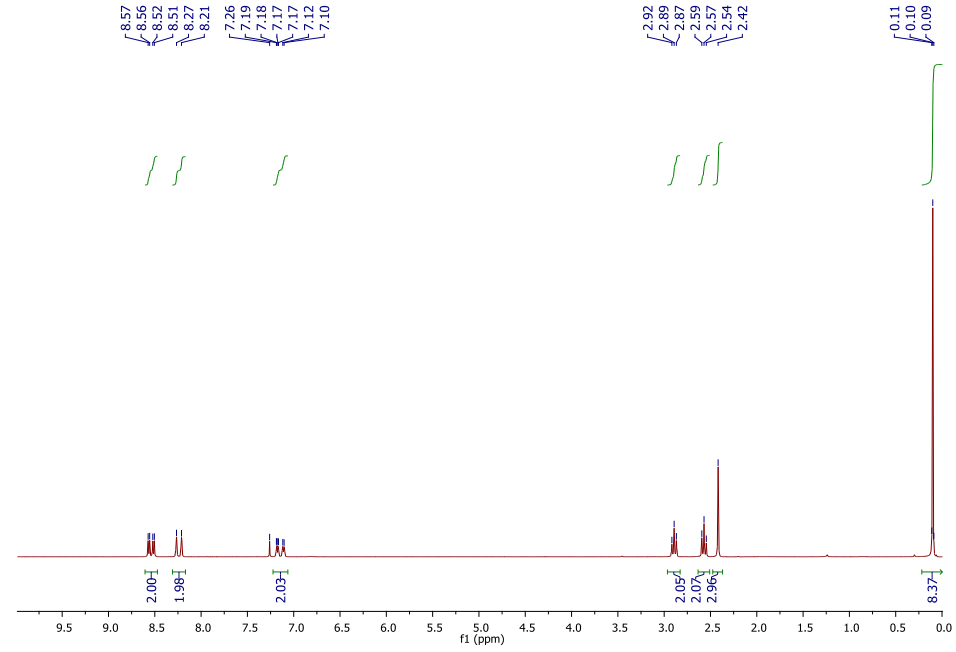


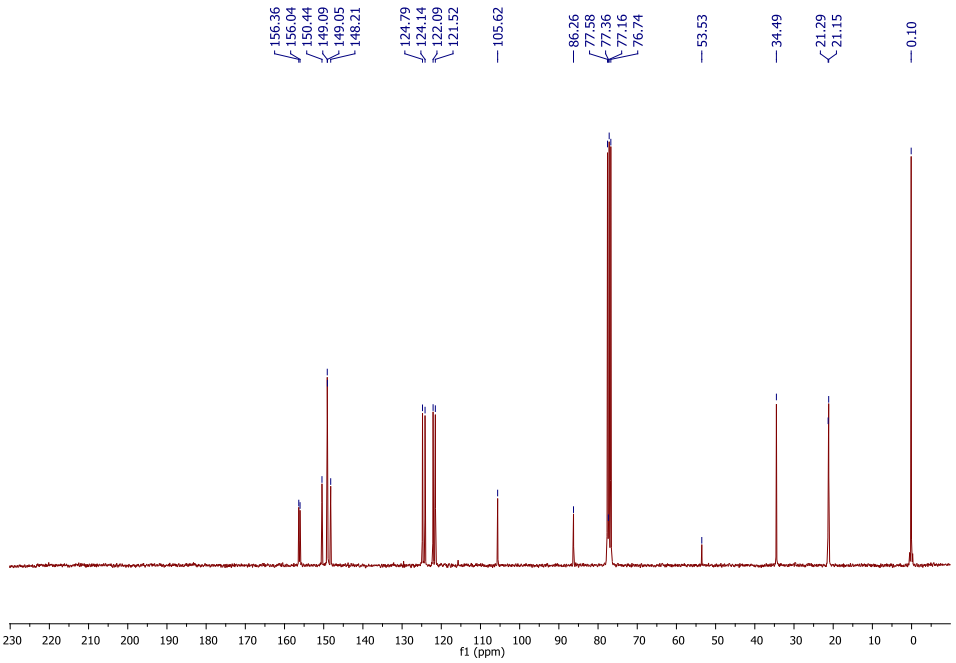




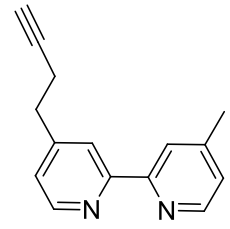
c. ^{1}H and ^{13}C NMR spectra for compound (5)

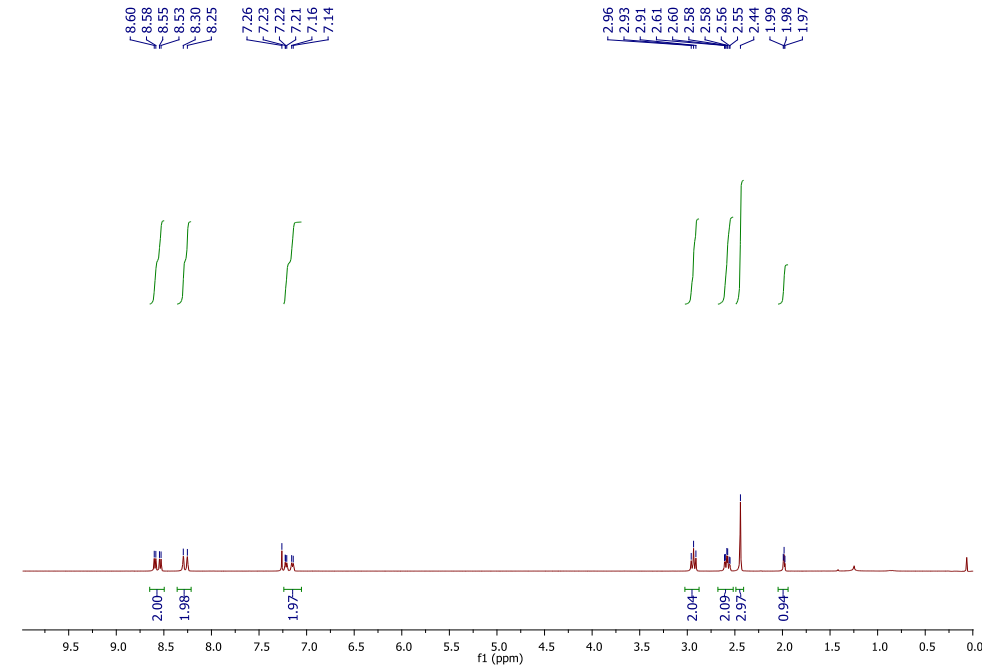


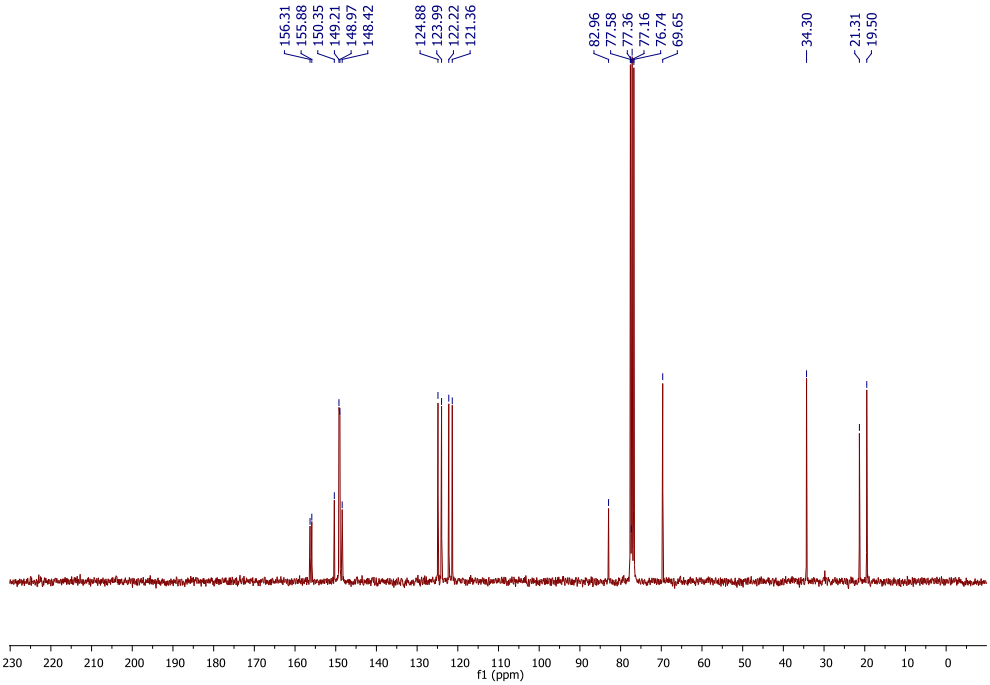




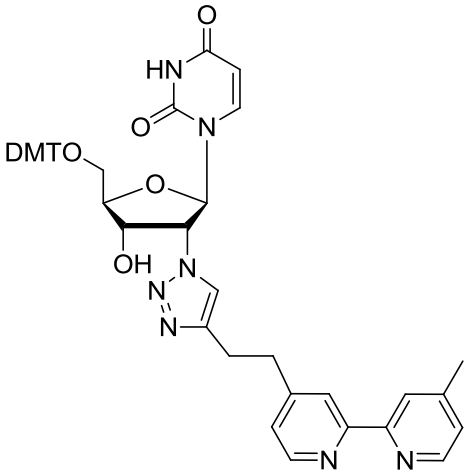
d. ^{1}H and ^{13}C NMR spectra for compound (6)

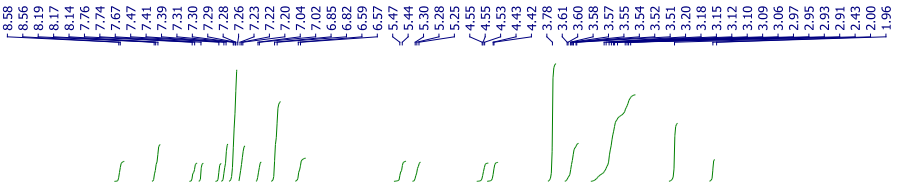


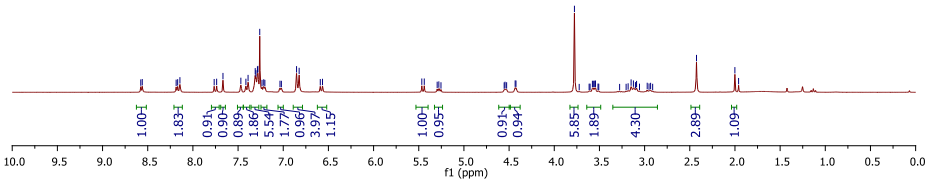


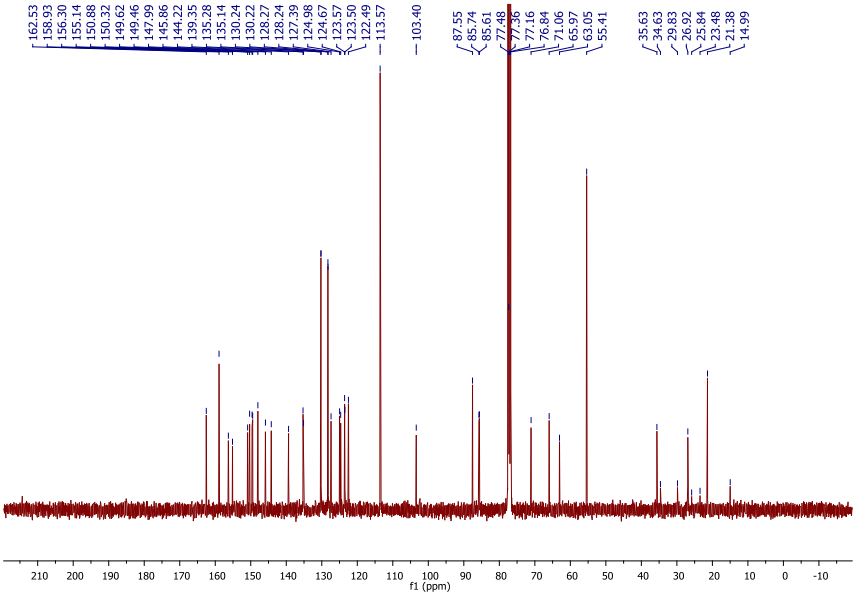


e. ^{1}H and ^{13}C NMR spectra of compound (14)

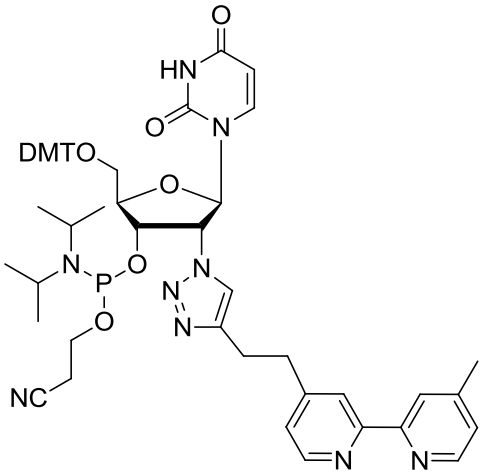


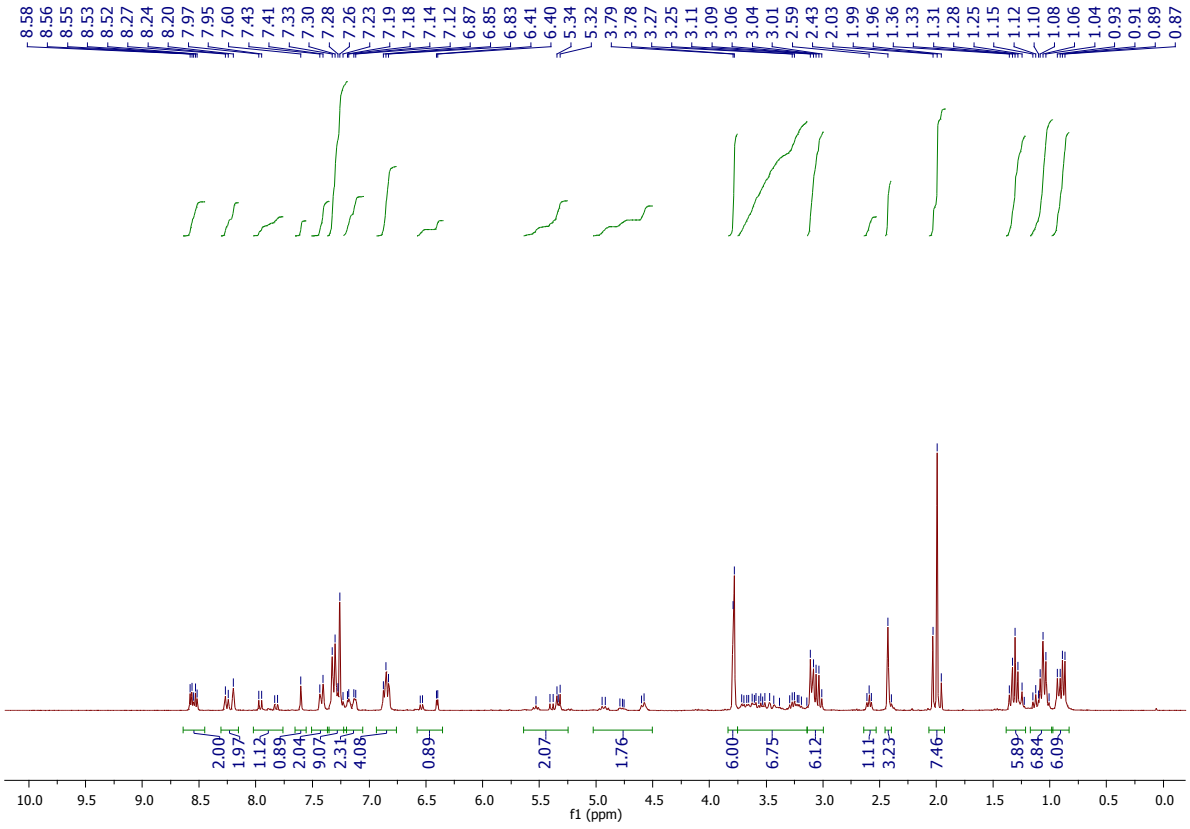


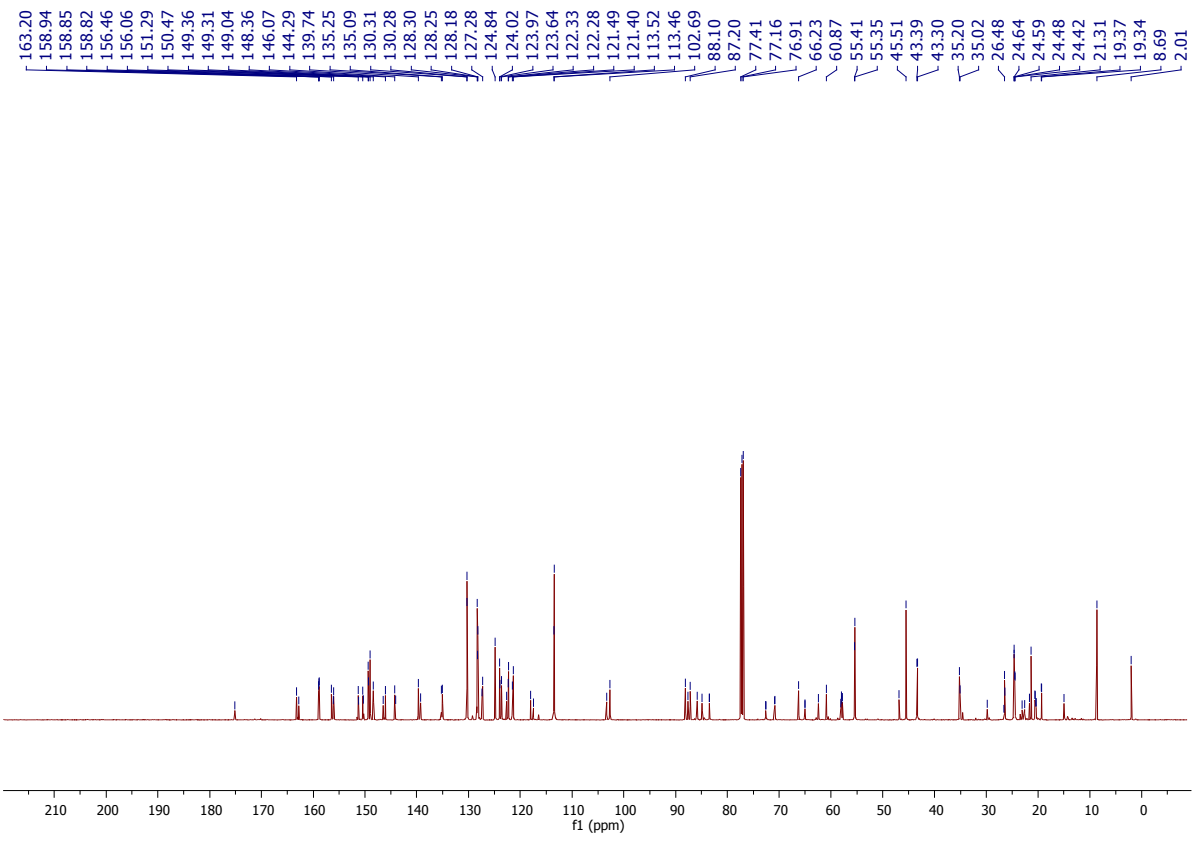




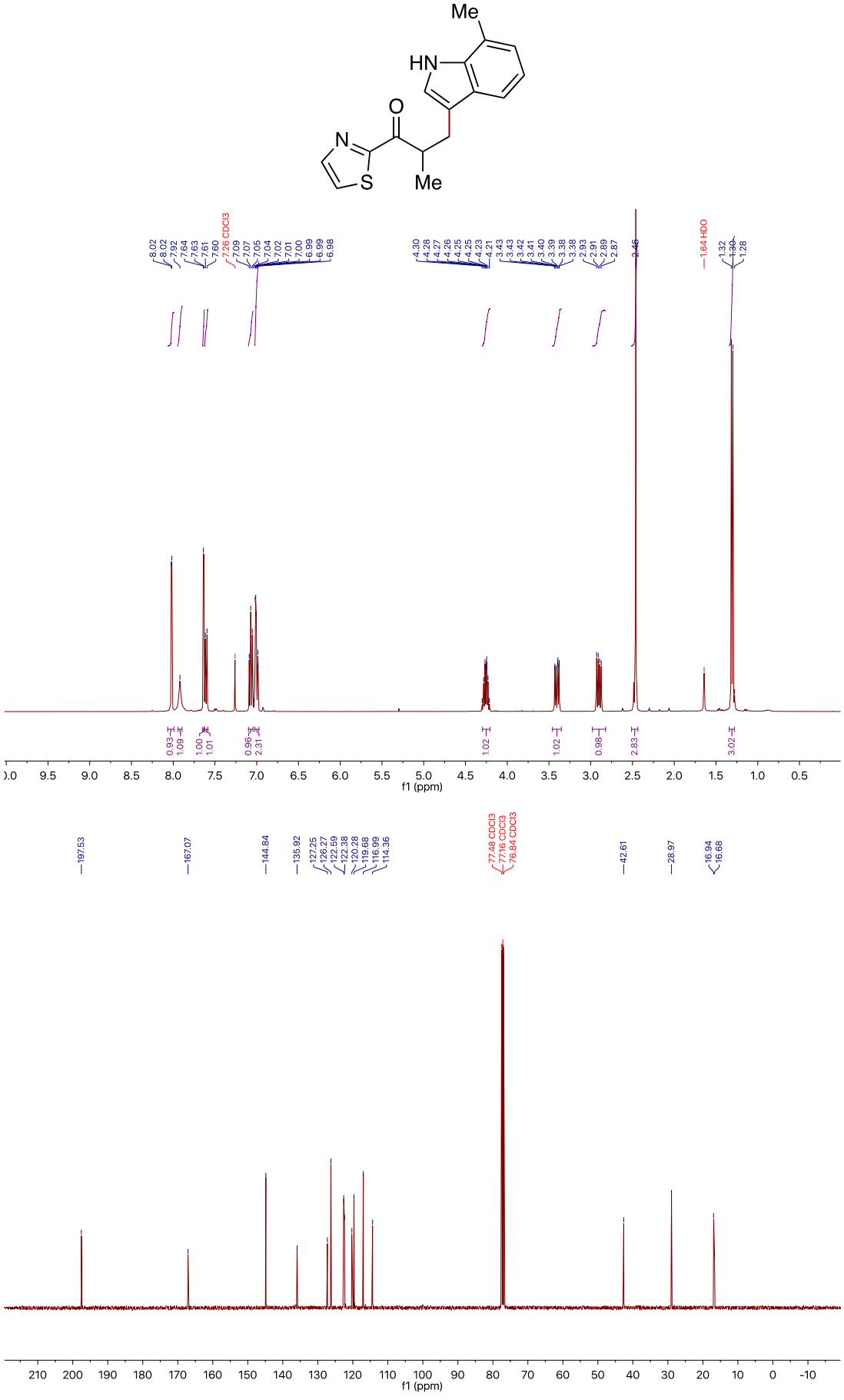
f. ^{1}H, ^{13}C and ^{31}P NMR spectra of compound (15)



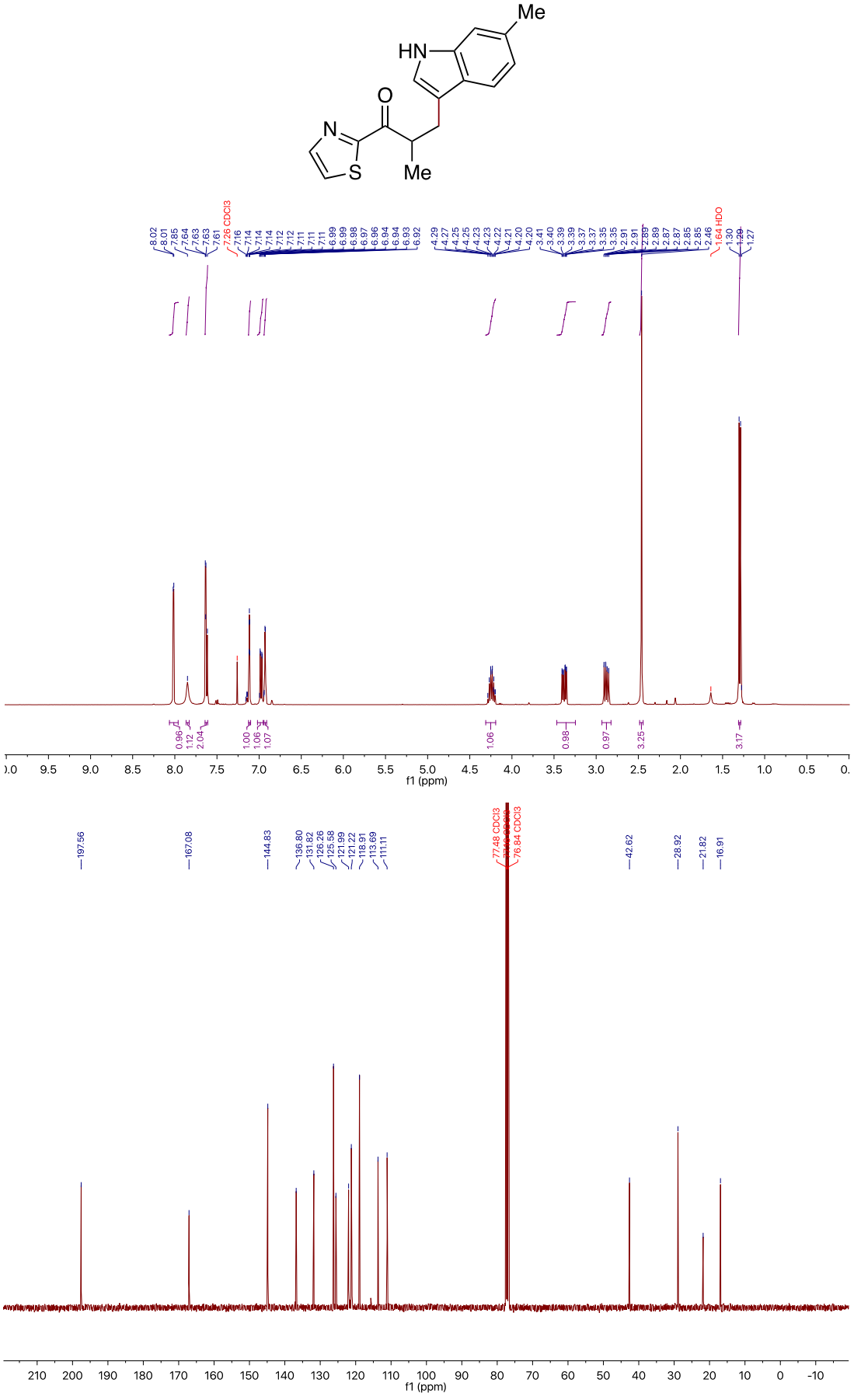



163.20
158.94
158.85
158.82
156.46
156.06
151.29
150.47
149.36
149.31
149.04
148.36
146.07
144.29
139.74
135.25
135.09
130.31
130.28
128.30
128.25
128.18
127.28
124.84
124.02
123.97
123.64
122.33
122.28
121.49
121.40
113.52
113.46
102.69
88.10
87.20
77.41
77.16
76.91
66.23
60.87
55.41
55.35
45.51
43.39
43.30
35.20
35.02
26.48
24.64
24.59
24.48
24.42
21.31
19.37
19.34
8.69
2.01
210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0
f1 (ppm)
151.57
150.39
37.36
62.00
200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 -10 -20 -30 -40 -50 -60 -70 -80 -90
f1 (ppm)

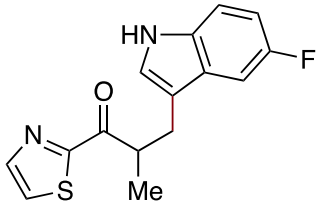
g. ^{1}H and ^{13}C spectra of compound (18e)

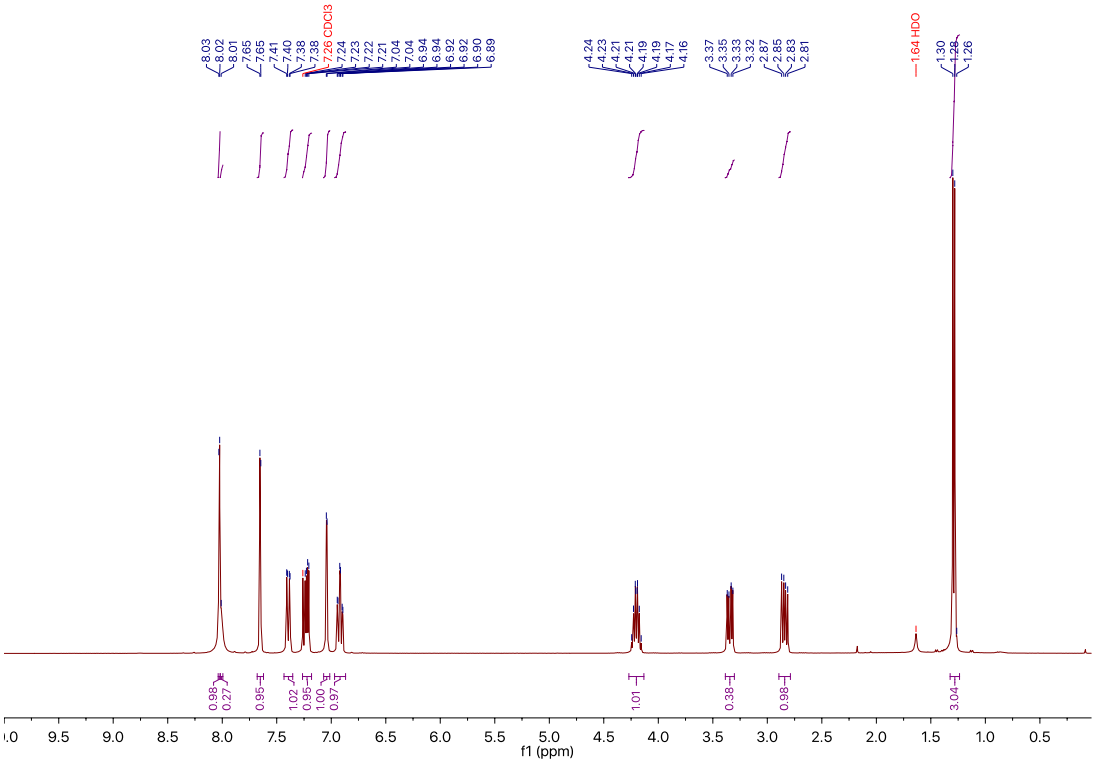


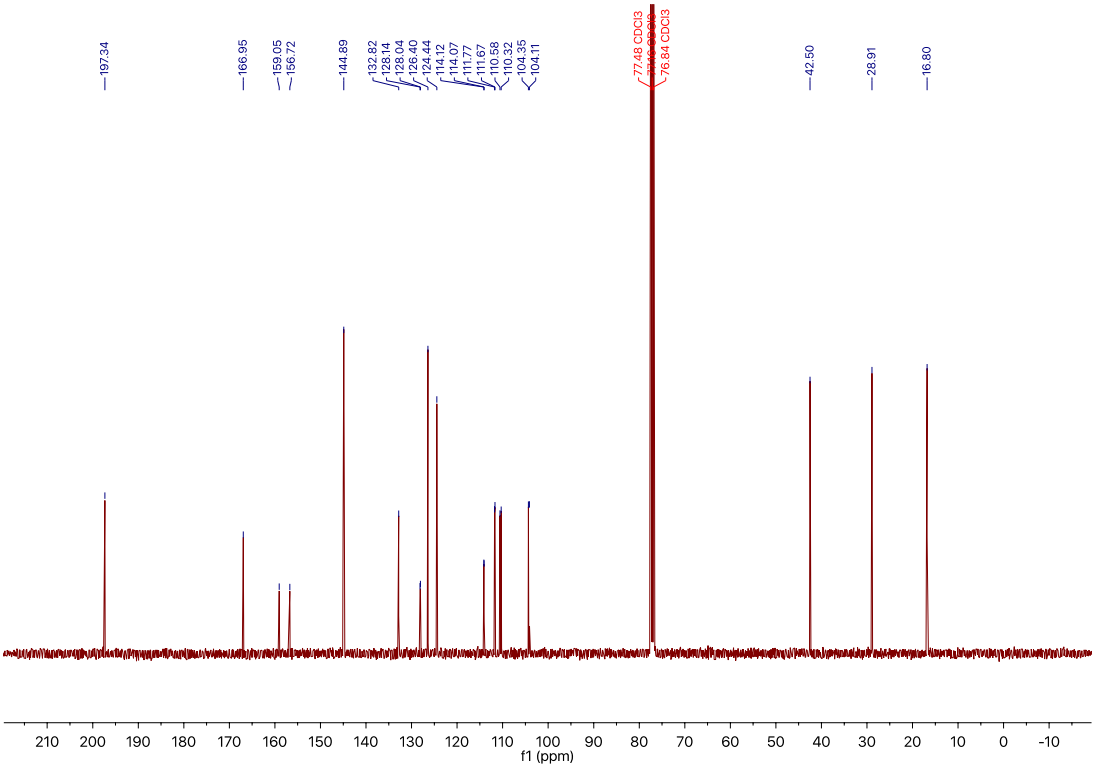
h. ^{1}H and ^{13}C NMR spectra of compound (18f)

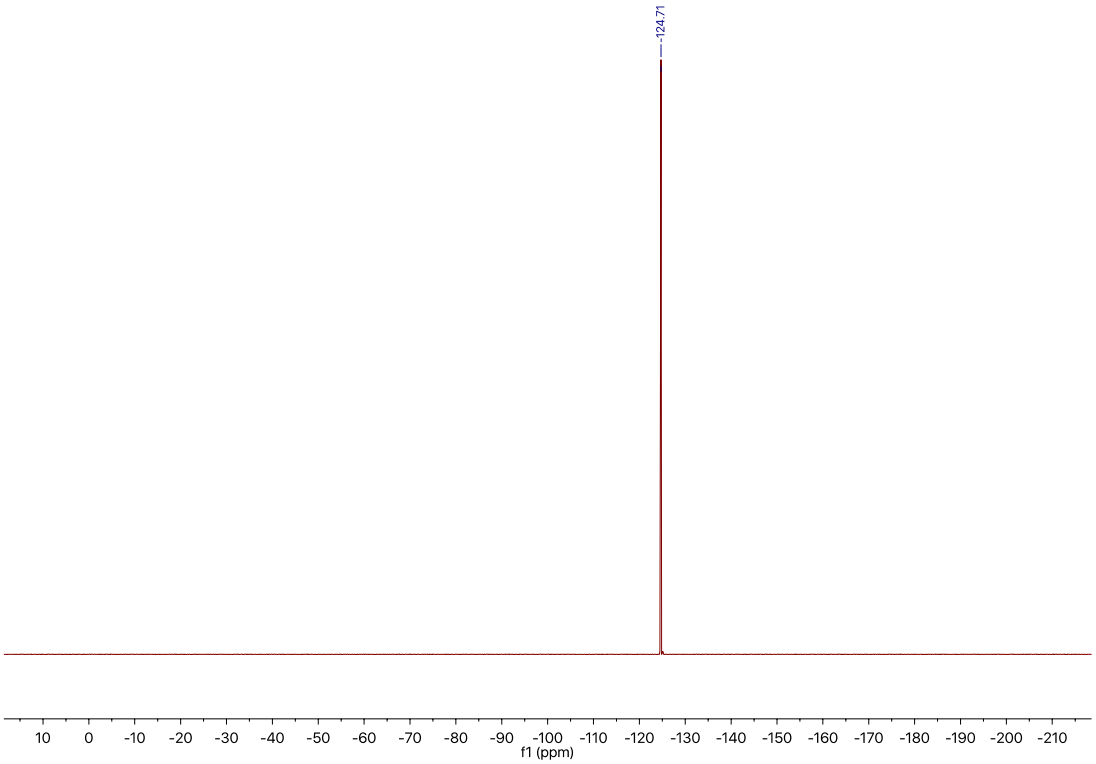


i. ^{1}H, ^{13}C and ^{19}F NMR spectra of compound (18i)

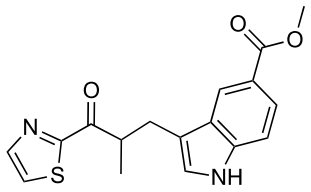


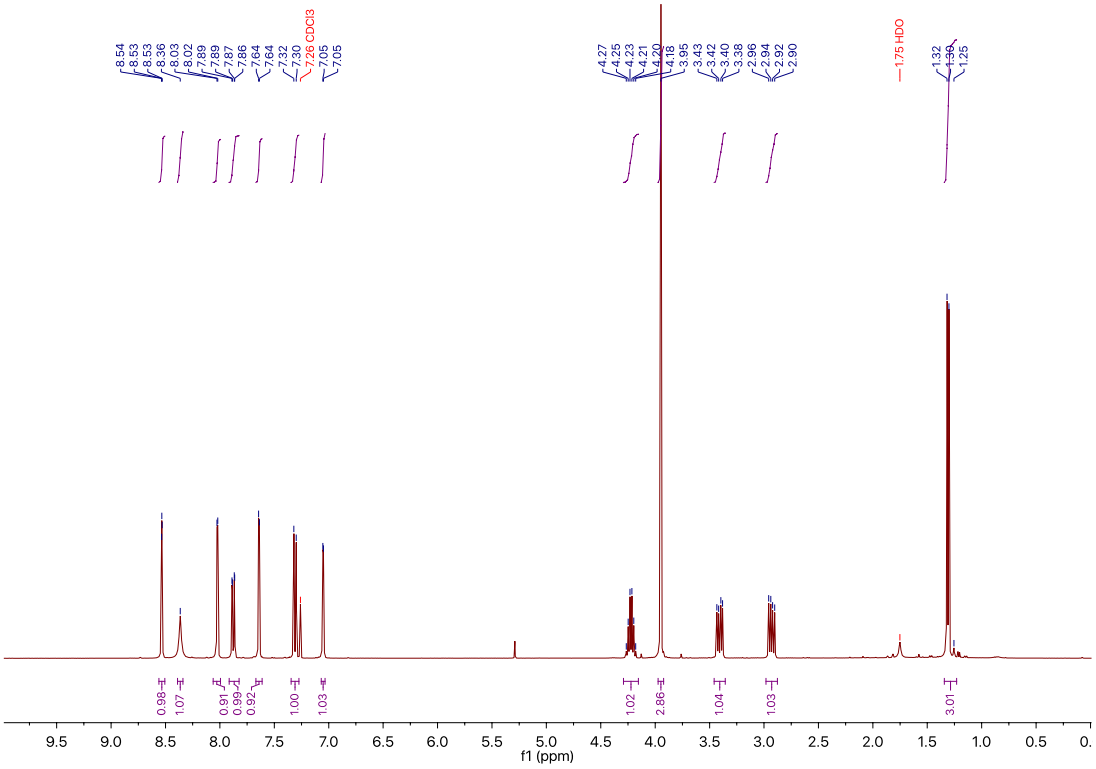


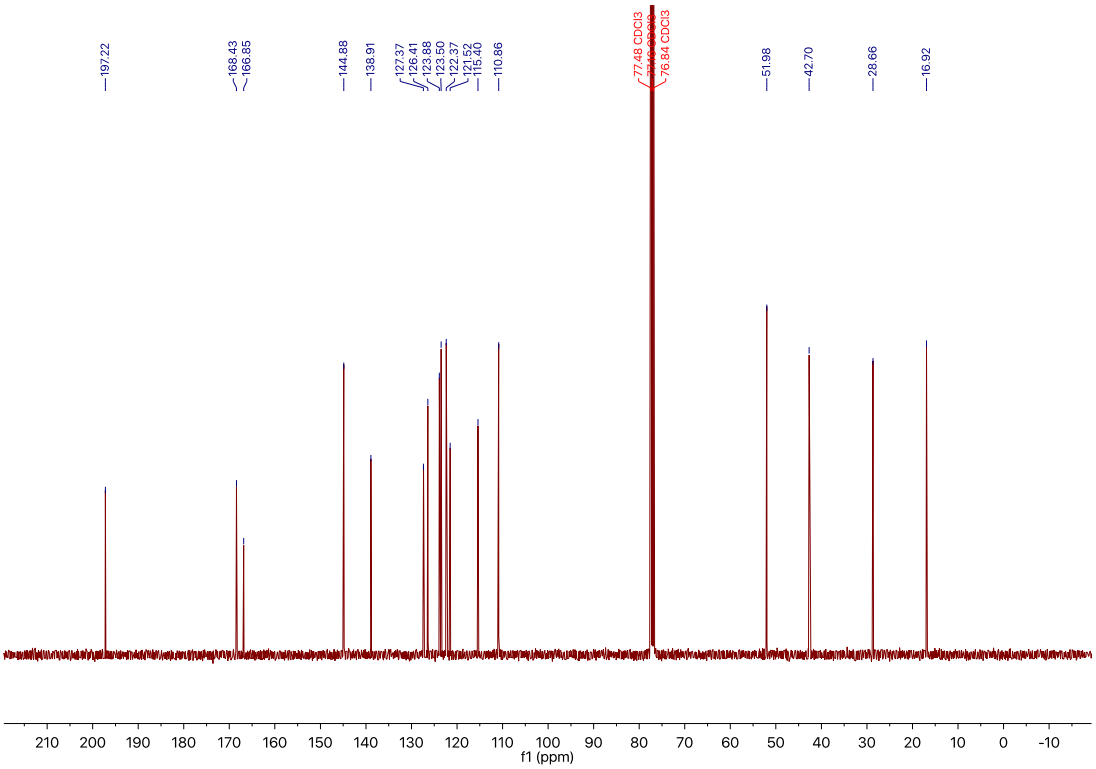



-124.71
10 0 -10 -20 -30 -40 -50 -60 -70 -80 -90 -100 -110 -120 -130 -140 -150 -160 -170 -180 -190 -200 -210
f1 (ppm)

j. ^{1}H and ^{13}C NMR spectra of compound (18l)

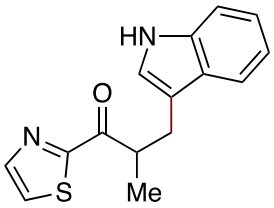




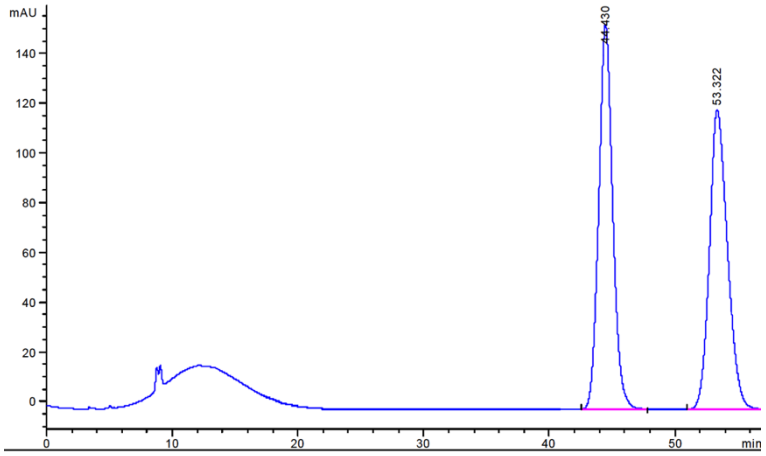


VI. Results of catalysis : HPLC chromatograms

a. HPLC chromatograms of compound (18a)

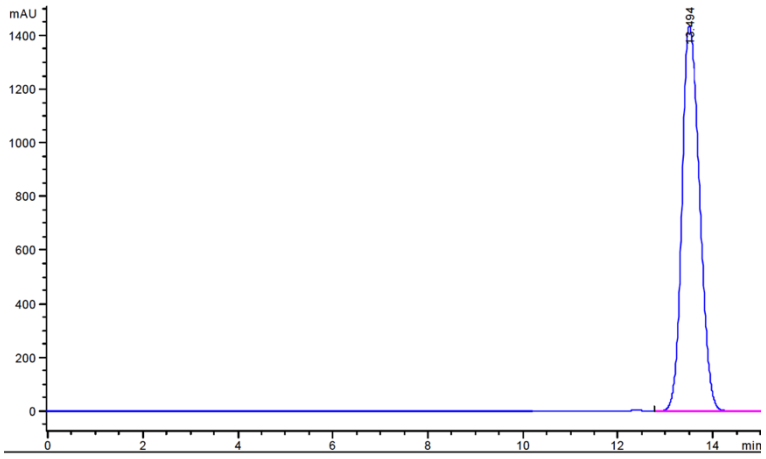


Racemic [Chiralpak IA column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 97:3, 1 mL/min, λ = 280 nm, t_R = 44.430 min and t_R = 53.322 min].

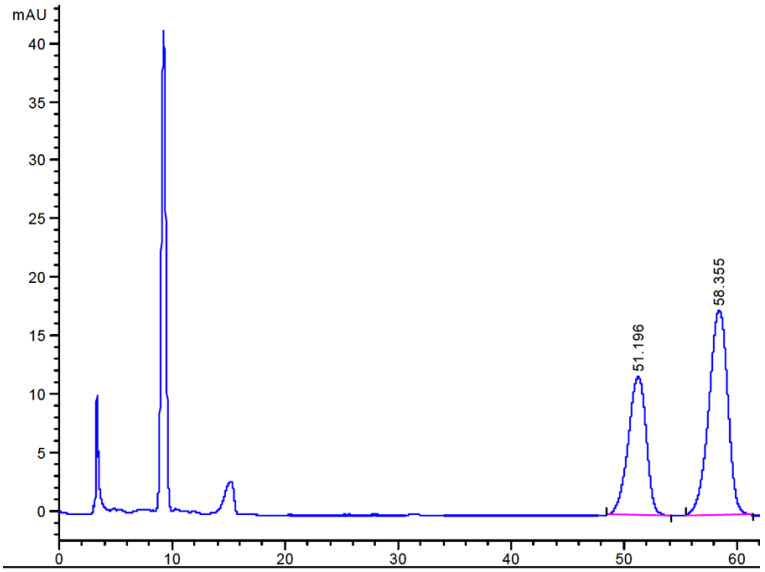


Peak	Retention Time	Rel. Area
	min	%
1	44.430	49.9295
2	53.322	50.0705

Indole [Chiralpak IA column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 97:3, 1 mL/min, λ = 280 nm, t_R = 13.494 min].

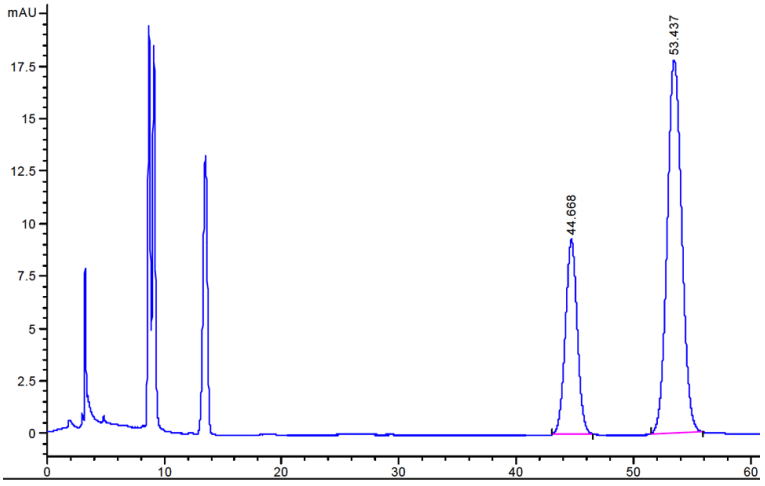


Following the general procedure A. HPLC analysis of the crude residue indicated a ratio indole/**18a** of 5:95 and an enantiomeric excess of (+) 21 [Chiralpak IA column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 97:3, 1 mL/min, λ = 280 nm, t_R = 51.196 min and t_R = 58.355 min].



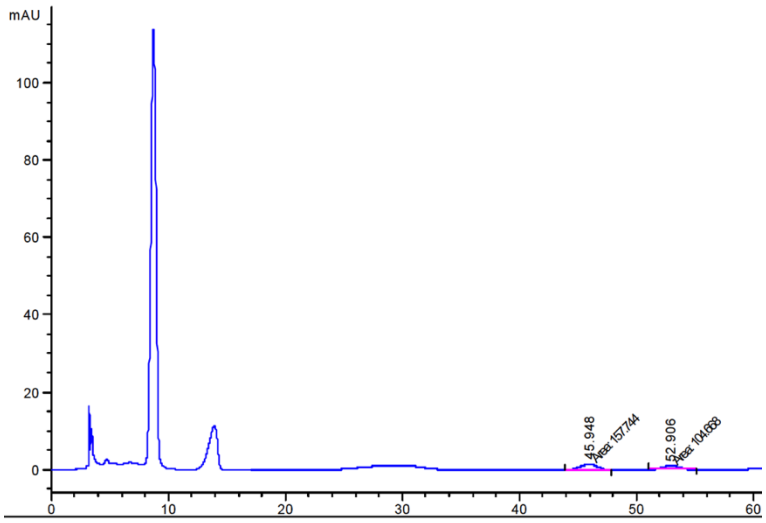
Peak	Retention Time	Rel. Area
	min	%
1	51.196	39.3979
2	58.355	60.6021

Following the general procedure B. HPLC analysis of the crude residue indicated a ratio indole/**18a** of 13:87 and an enantiomeric excess of (+) 40 [Chiralpak IA column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 97:3, 1 mL/min, λ = 280 nm, t_R = 44.668 min and t_R = 53.437 min].



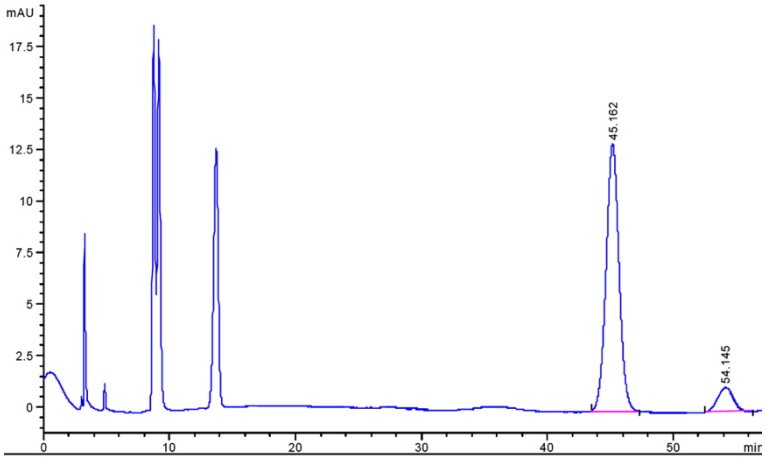
Peak	Retention Time	Rel. Area
	min	%
1	44.668	29.8503
2	53.437	70.1497

Following the general procedure C. HPLC analysis of the crude residue indicated a ratio indole/**18a** of 70:30 and an enantiomeric excess of (-) 20 [Chiralpak IA column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 97:3, 1 mL/min, λ = 280 nm, t_R = 45.948 min and t_R = 52.906 min].



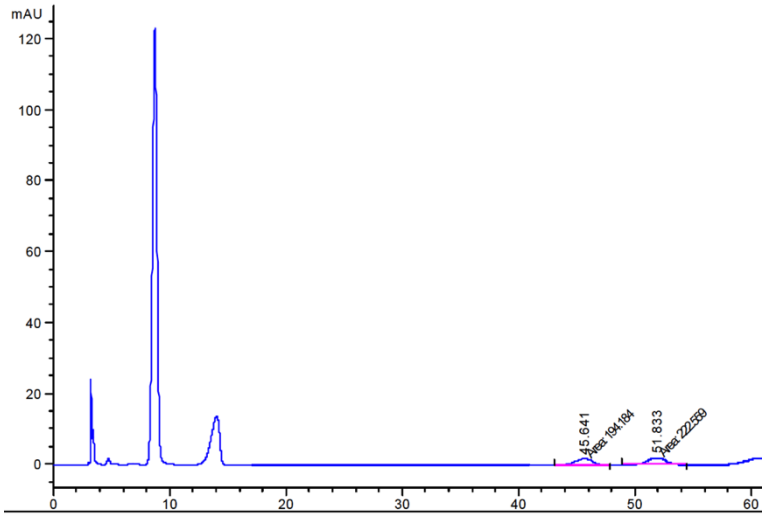
Peak	Retention Time	Rel. Area
	min	%
1	45.948	60.1132
2	52.906	39.8868

F**ollowing the general procedure D.** HPLC analysis of the crude residue indicated a ratio indole/**18a** of 24:76 and an enantiomeric excess of (-) 80 [Chiralpak IA column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 97:3, 1 mL/min, λ = 280 nm, t_R = 45.162 min and t_R = 54.145 min].



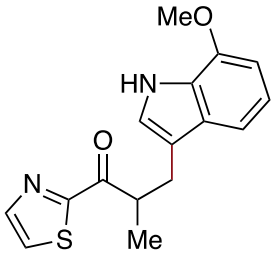
Peak	Retention Time	Rel. Area
	min	%
1	45.162	90.0588
2	54.145	9.9412

Following the general procedure E. HPLC analysis of the crude residue indicated a ratio indole/**18a** of 70:30 and an enantiomeric excess of (+) 7 [Chiralpak IA column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 97:3, 1 mL/min, λ = 280 nm, t_R = 45.641 min and t_R = 51.833 min].

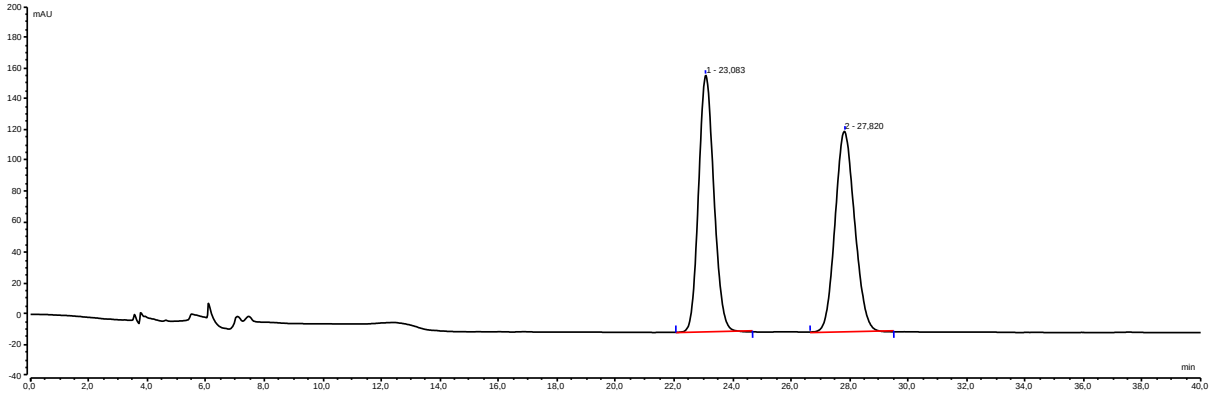


Peak	Retention Time	Rel. Area
	min	%
1	45.641	46.5957
2	51.833	53.4043

b. HPLC chromatograms of compound (18b)

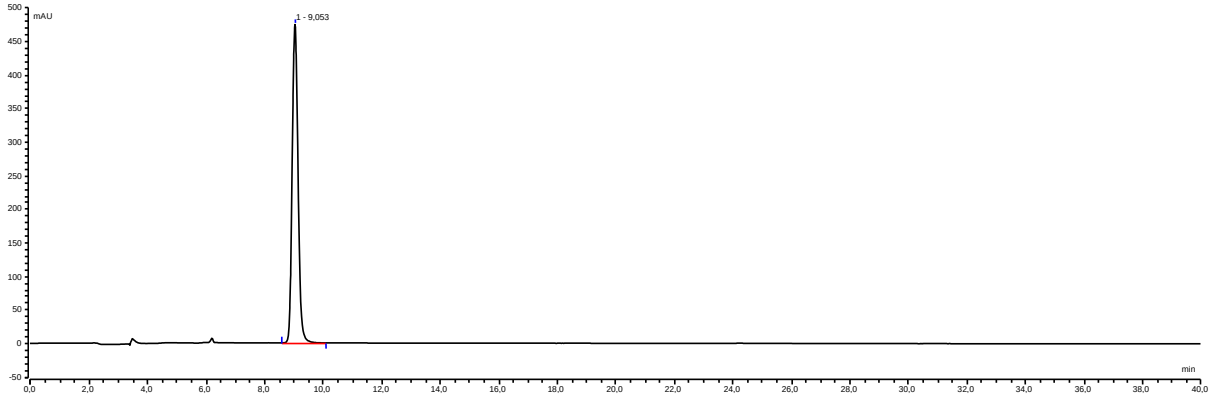


Racemic [Chiralpak IB column, 100 bar, T = 20 °C, *n*-Heptane (+ 0.1% diethylamine)/EtOH (+ 0.1% diethylamine) = 95:5, 1 mL/min, λ = 300 nm, t_R = 23.083 min and t_R = 27.820 min].



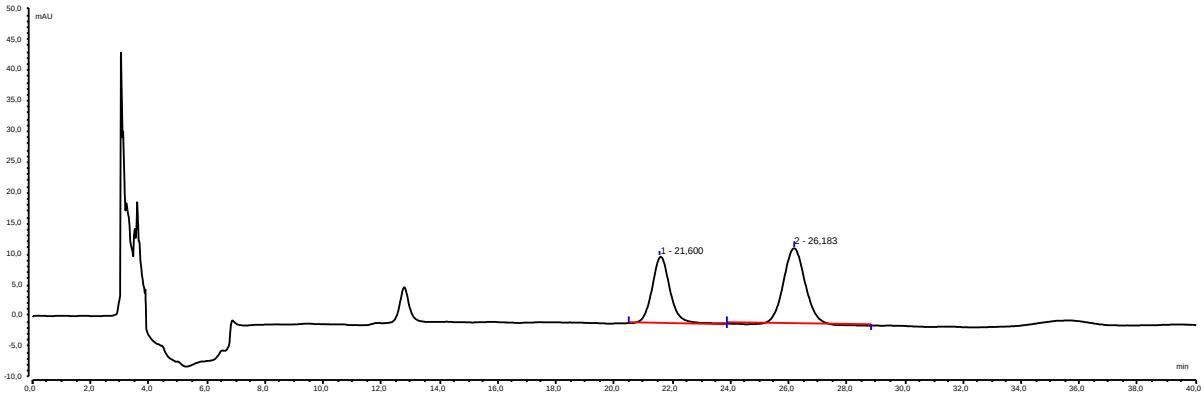
Peak Name	Retention Time	Rel.Area
	min	%
1	23,083	50,04
2	27,82	49,96

Indole [Chiralpak IB column, 100 bar, T = 20 °C, *n*-Heptane (+ 0.1% diethylamine)/EtOH (+ 0.1% diethylamine) = 95:5, 1 mL/min, λ = 300 nm, t_R = 9.053 min].



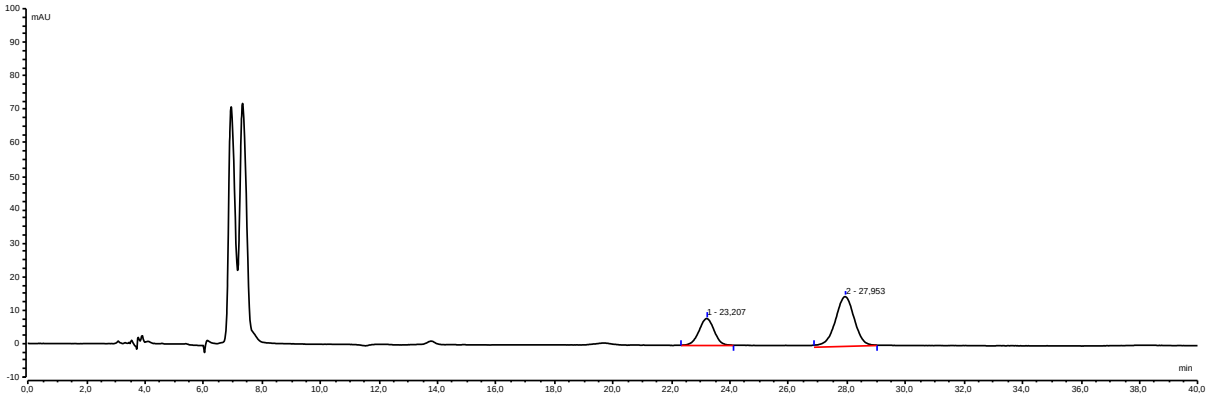
Peak Name	Retention Time	Rel.Area
	min	%
1	9,053	100

Following the general procedure A. HPLC analysis of the crude residue indicated a ratio indole/**18b** of 4:96 and an enantiomeric excess of (+) 17 [Chiralpak IB column, 100 bar, T = 20 °C, *n*-Heptane (+ 0.1% diethylamine)/EtOH (+ 0.1% diethylamine) = 95:5, 1 mL/min, λ = 300 nm, t_R = 21.600 min and t_R = 26.183 min].



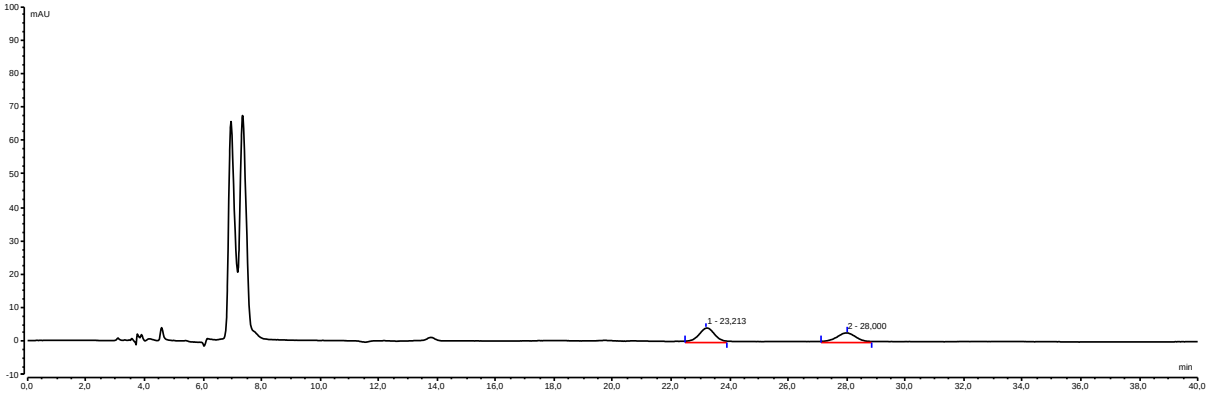
Peak Name	Retention Time	Rel.Area
	min	%
1	21,6	41,4
2	26,183	58,6

Following the general procedure B. HPLC analysis of the crude residue indicated a ratio indole/**18b** of 20:80 and an enantiomeric excess of (+) 38 [Chiralpak IB column, 100 bar, T = 20 °C, *n*-Heptane (+ 0.1% diethylamine)/EtOH (+ 0.1% diethylamine) = 95:5, 1 mL/min, λ = 300 nm, t_R = 23.207 min and t_R = 27.953 min].



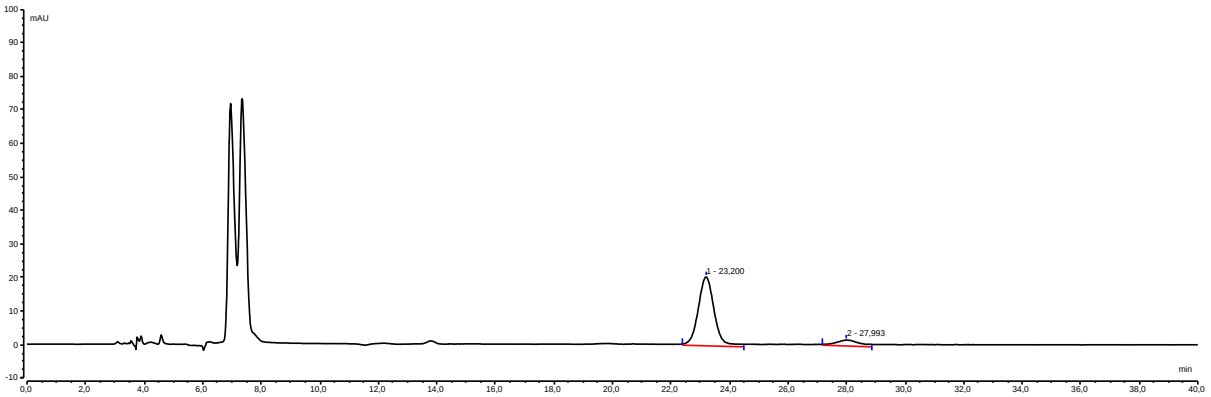
Peak Name	Retention Time	Rel.Area
	min	%
1	23,207	31,02
2	27,953	68,98

Following the general procedure C. HPLC analysis of the crude residue indicated a ratio indole/**18b** of 48:52 and an enantiomeric excess of (-) 12 [Chiralpak IB column, 100 bar, T = 20 °C, *n*-Heptane (+ 0.1% diethylamine)/EtOH (+ 0.1% diethylamine) = 95:5, 1 mL/min, λ = 300 nm, t_R = 23.213 min and t_R = 28.000 min].



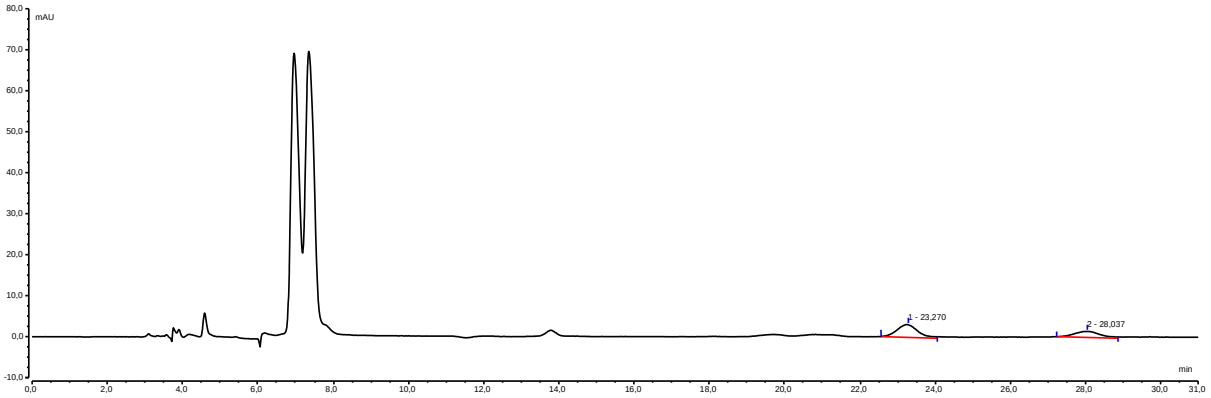
Peak Name	Retention Time	Rel.Area
	min	%
1	23,213	56,18
2	28	43,82

Following the general procedure D. HPLC analysis of the crude residue indicated a ratio indole/**18b** of 22:78 and an enantiomeric excess of (-) 86 [Chiralpak IB column, 100 bar, T = 20 °C, *n*-Heptane (+ 0.1% diethylamine)/EtOH (+ 0.1% diethylamine) = 95:5, 1 mL/min, λ = 300 nm, t_R = 23.200 min and t_R = 27.993 min].



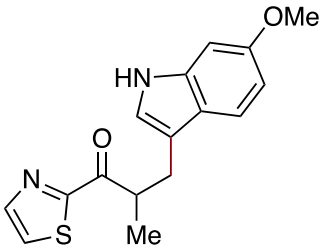
Peak Name	Retention Time	Rel.Area
	min	%
1	23,2	93,02
2	27,993	6,98

Following the general procedure E. HPLC analysis of the crude residue indicated a ratio indole/**18b** of 68:32 and an enantiomeric excess of (-) 29 [Chiralpak IB column, 100 bar, T = 20 °C, *n*-Heptane (+ 0.1% diethylamine)/EtOH (+ 0.1% diethylamine) = 95:5, 1 mL/min, λ = 300 nm, t_R = 23.270 min and t_R = 28.037 min].

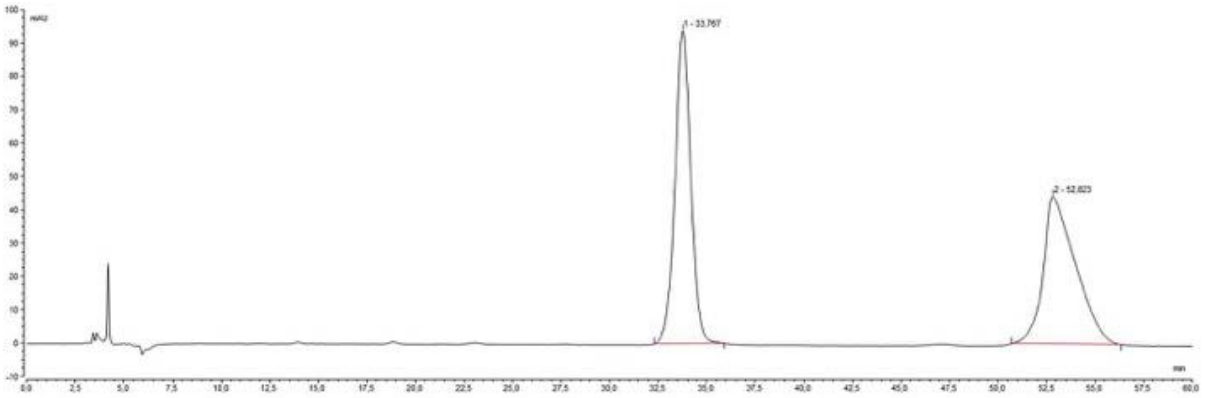


Peak Name	Retention Time	Rel.Area
	min	%
1	23,27	64,64
2	28,037	35,36

c. HPLC chromatograms of compound (18c)

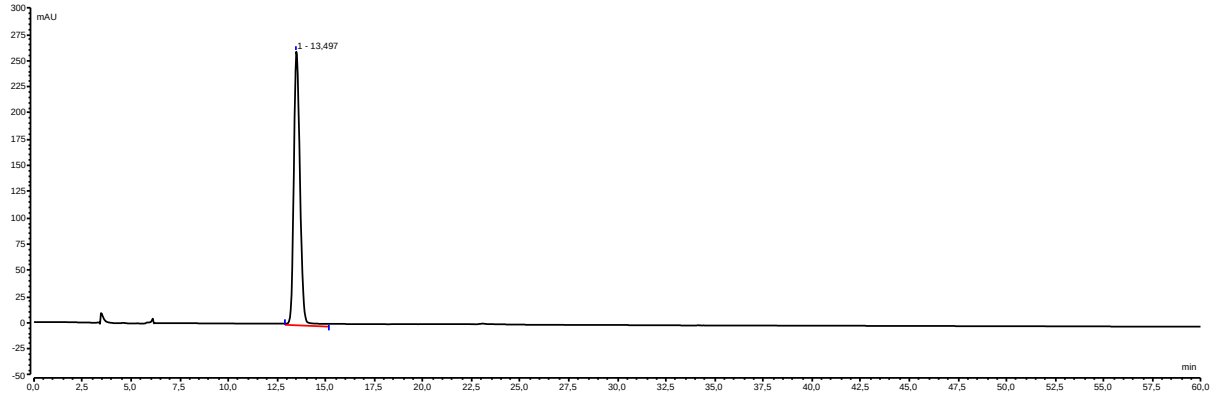


Racemic [Chiralpak IA column, 100 bar, T = 25°C, *n*-Heptane (+ 0.1% diethylamine)/EtOH (+ 0.1% diethylamine) = 95:5, 1 mL/min, λ = 300 nm, t_R = 33.767 min and t_R = 52.823 min].



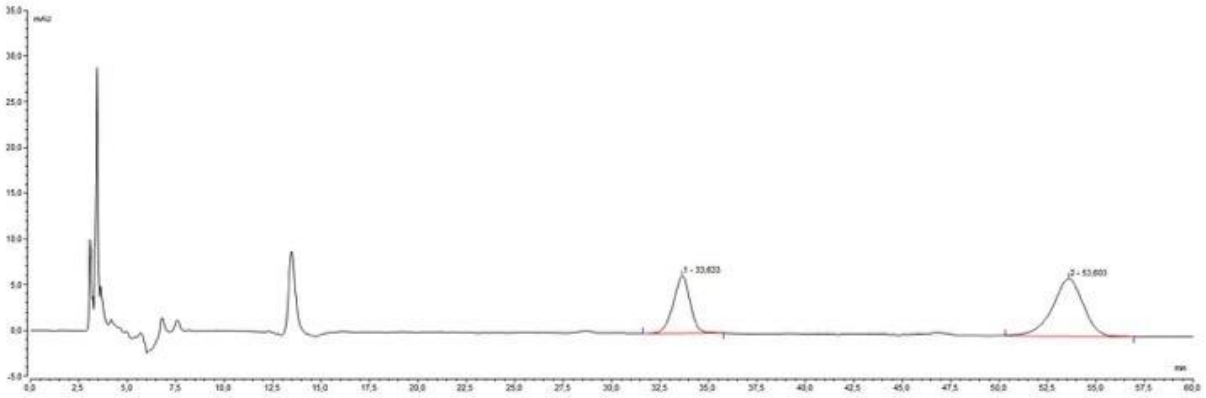
Peak Name	Retention Time	Rel.Area
	min	%
1	33,767	50,9
2	52,823	49,1

Indole [Chiralpak IA column, 100 bar, T = 25 °C, *n*-Heptane (+ 0.1% diethylamine)/EtOH (+ 0.1% diethylamine) = 95:5, 1 mL/min, λ = 300 nm, t_R = 13.497 min].



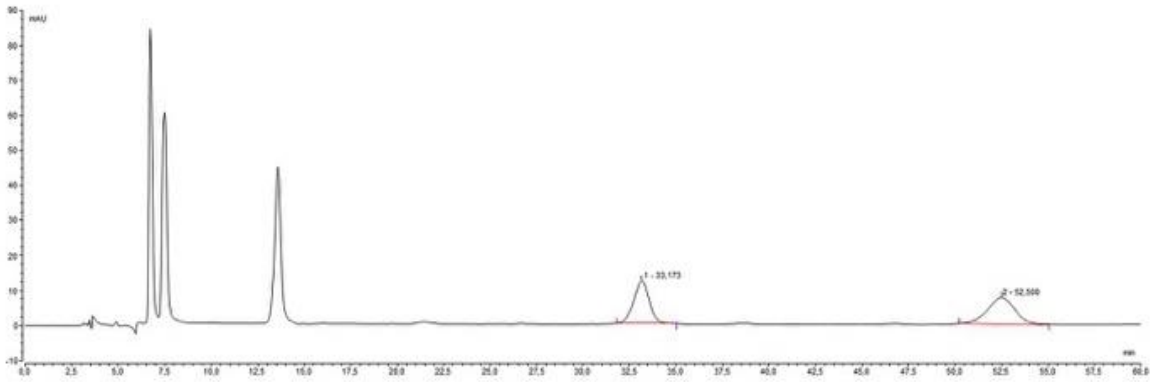
Peak Name	Retention Time	Rel.Area
	min	%
1	13,497	100

Following the general procedure A. HPLC analysis of the crude residue indicated a ratio indole/**18c** of 12:88 and an enantiomeric excess of (+) 29 [Chiralpak IA column, 100 bar, T = 25 °C, *n*-Heptane (+ 0.1% diethylamine)/EtOH (+ 0.1% diethylamine) = 95:5, 1 mL/min, λ = 300 nm, t_R = 33.633 min and t_R = 53.603 min].



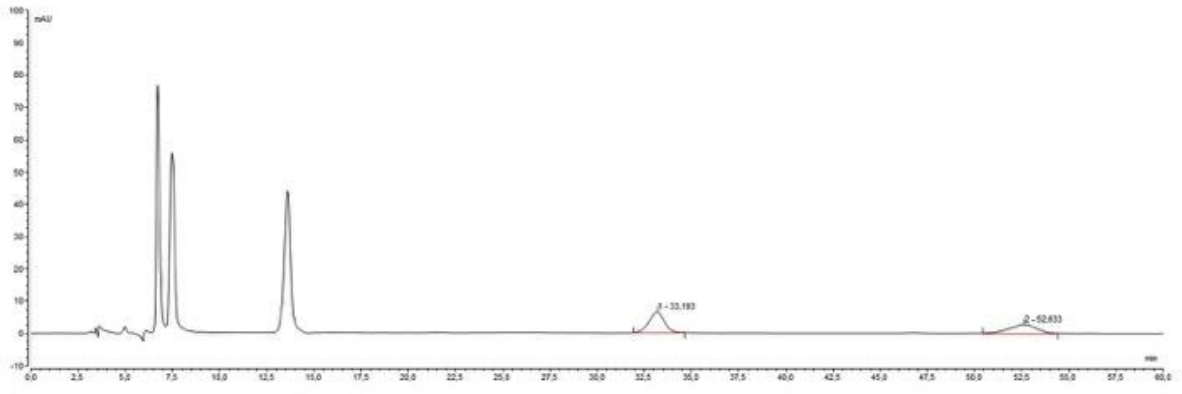
Peak Name	Retention Time	Rel.Area
	min	%
1	33,633	35,28
2	53,603	64,72

Following the general procedure B. HPLC analysis of the crude residue indicated a ratio indole/**18c** of 35:65 and an enantiomeric excess of (+) 5 [Chiralpak IA column, 100 bar, T = 25 °C, *n*-Heptane (+ 0.1% diethylamine)/EtOH (+ 0.1% diethylamine) = 95:5, 1 mL/min, λ = 300 nm, t_R = 33.163 min and t_R = 52.503 min].



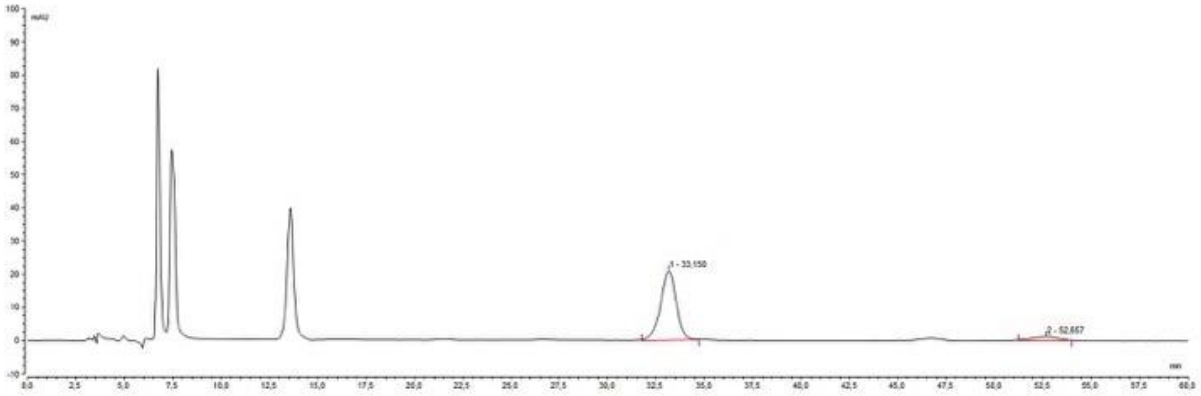
Peak Name	Retention Time	Rel.Area
	min	%
1	33,163	47,62
2	52,503	52,38

Following the general procedure C. HPLC analysis of the crude residue indicated a ratio indole/**18c** of 56:44 and an enantiomeric excess of (-) 16 [Chiralpak IA column, 100 bar, T = 25 °C, *n*-Heptane (+ 0.1% diethylamine)/EtOH (+ 0.1% diethylamine) = 95:5, 1 mL/min, λ = 300 nm, t_R = 33.193 min and t_R = 52.633 min].



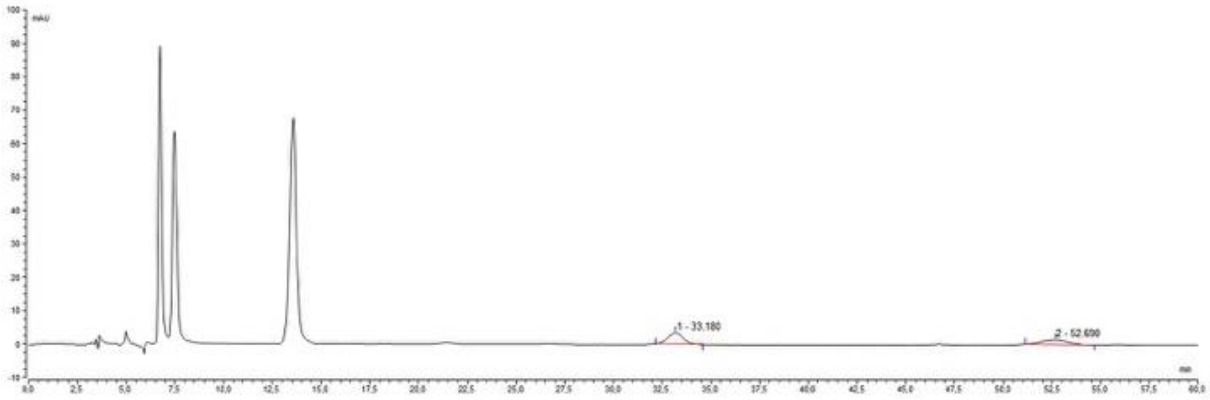
Peak Name	Retention Time	Rel.Area
	min	%
1	33,193	58,09
2	52,633	41,91

Following the general procedure D. HPLC analysis of the crude residue indicated a ratio indole/**18c** of 36:64 and an enantiomeric excess of (-) 86 [Chiralpak IA column, 100 bar, T = 25 °C, *n*-Heptane (+ 0.1% diethylamine)/EtOH (+ 0.1% diethylamine) = 95:5, 1 mL/min, λ = 300 nm, t_R = 33.150 min and t_R = 52.657 min].



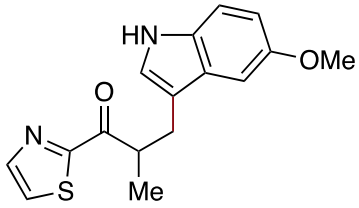
Peak Name	Retention Time	Rel.Area
	min	%
1	33,15	93,19
2	52,657	6,81

Following the general procedure E. HPLC analysis of the crude residue indicated a ratio indole/**18c** of 79:21 and an enantiomeric excess of (-) 19 [Chiralpak IA column, 100 bar, T = 25 °C, *n*-Heptane (+ 0.1% diethylamine)/EtOH (+ 0.1% diethylamine) = 95:5, 1 mL/min, λ = 300 nm, t_R = 33.180 min and t_R = 52.690 min].

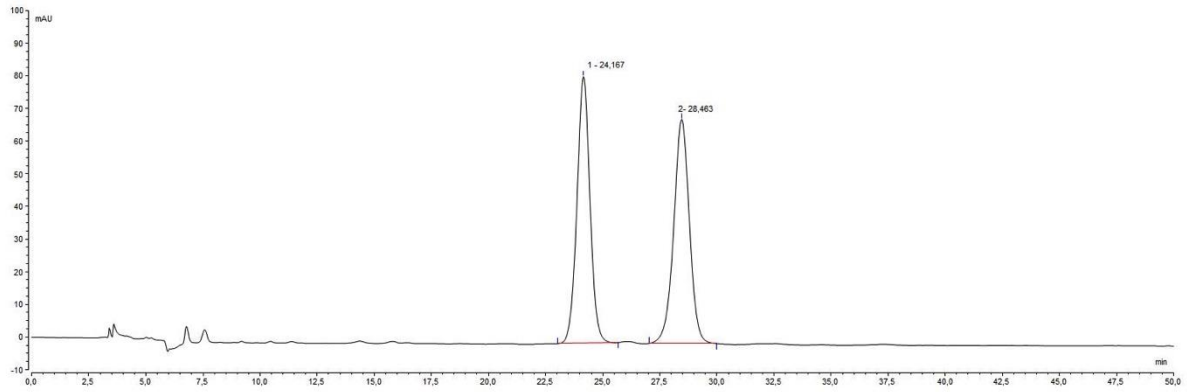


Peak Name	Retention Time	Rel.Area
	min	%
1	33,18	59,64
2	52,69	40,36

d. HPLC chromatograms of compound (18d)

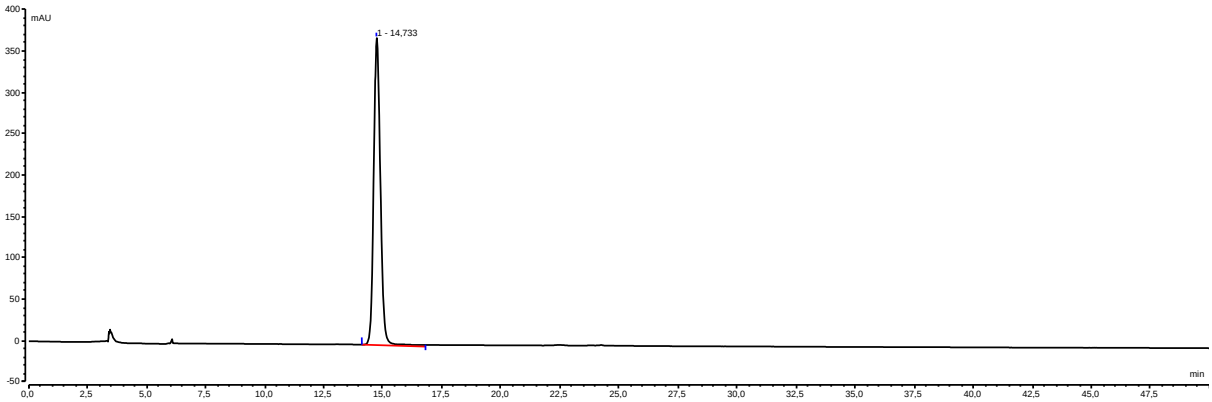


Racemic [Chiralpak IA column, 100 bar, T = 20 °C, *n*-Heptane (+ 0.1% diethylamine)/EtOH (+ 0.1% diethylamine) = 95:5, 1 mL/min, λ = 300 nm, t_R = 24.167 min and t_R = 28.463 min].



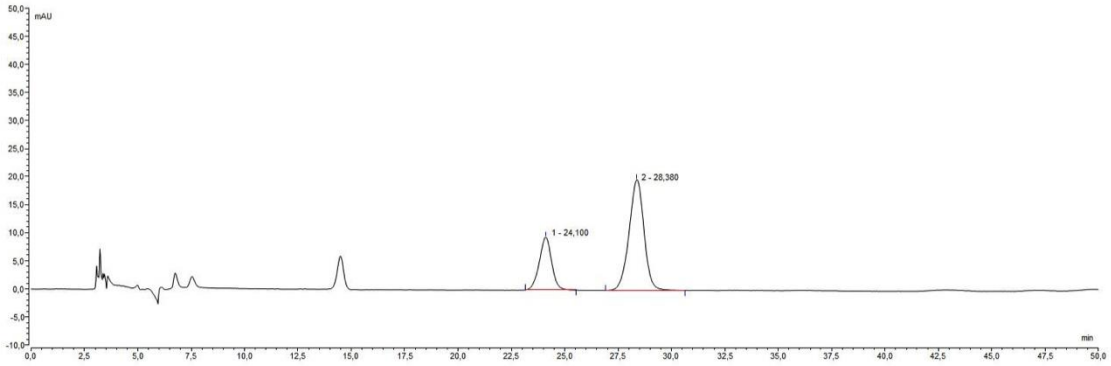
Peak Name	Retention Time	Rel.Area
	min	%
1	24,167	49,67
2	28,463	50,33

Indole [Chiralpak IA column, 100 bar, T = 20 °C, *n*-Heptane (+ 0.1% diethylamine)/EtOH (+ 0.1% diethylamine) = 95:5, 1 mL/min, λ = 300 nm, t_R = 14.733 min].



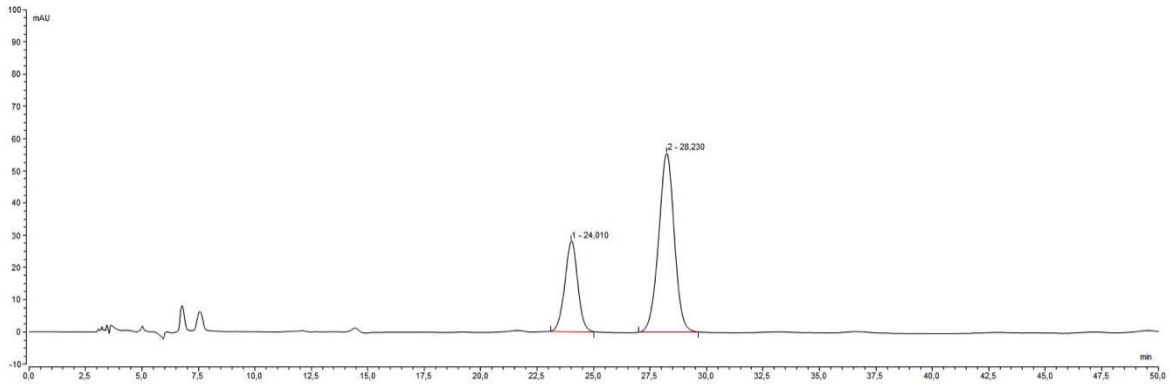
Peak Name	Retention Time	Rel.Area
	min	%
1	14,733	100

Following the general procedure A. HPLC analysis of the crude residue indicated a ratio indole/**18d** of 17:83 and an enantiomeric excess of (+) 43 [Chiralpak IA column, 100 bar, T = 20 °C, *n*-Heptane (+ 0.1% diethylamine)/EtOH (+ 0.1% diethylamine) = 95:5, 1 mL/min, λ = 300 nm, t_R = 24.100 min and t_R = 28.380 min].



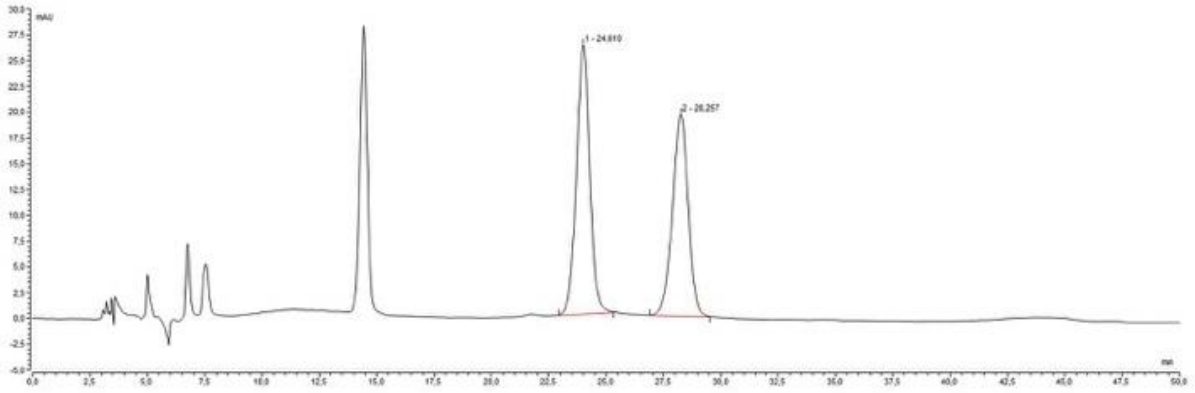
Peak Name	Retention Time	Rel.Area
	min	%
1	24,1	28,37
2	28,38	71,63

Following the general procedure B. HPLC analysis of the crude residue indicated a ratio indole/**18d** of 1:99 and an enantiomeric excess of (+) 41 [Chiralpak IA column, 100 bar, T = 20 °C, *n*-Heptane (+ 0.1% diethylamine)/EtOH (+ 0.1% diethylamine) = 95:5, 1 mL/min, λ = 300 nm, t_R = 24.010 min and t_R = 28.230 min].



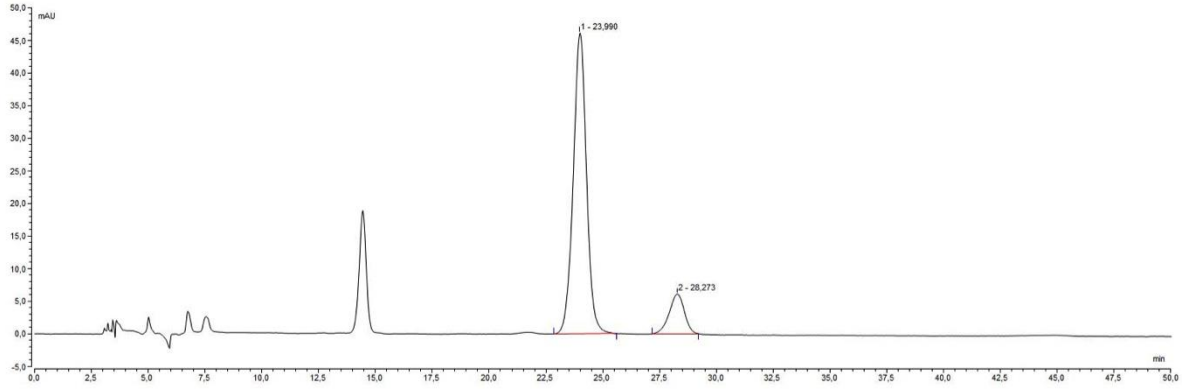
Peak Name	Retention Time	Rel.Area
	min	%
1	24,01	29,27
2	28,23	70,73

Following the general procedure C. HPLC analysis of the crude residue indicated a ratio indole/**18d** of 22:78 and an enantiomeric excess of (-) 6 [Chiralpak IA column, 100 bar, T = 20 °C, *n*-Heptane (+ 0.1% diethylamine)/EtOH (+ 0.1% diethylamine) = 95:5, 1 mL/min, λ = 300 nm, t_R = 24.010 min and t_R = 28.257 min].



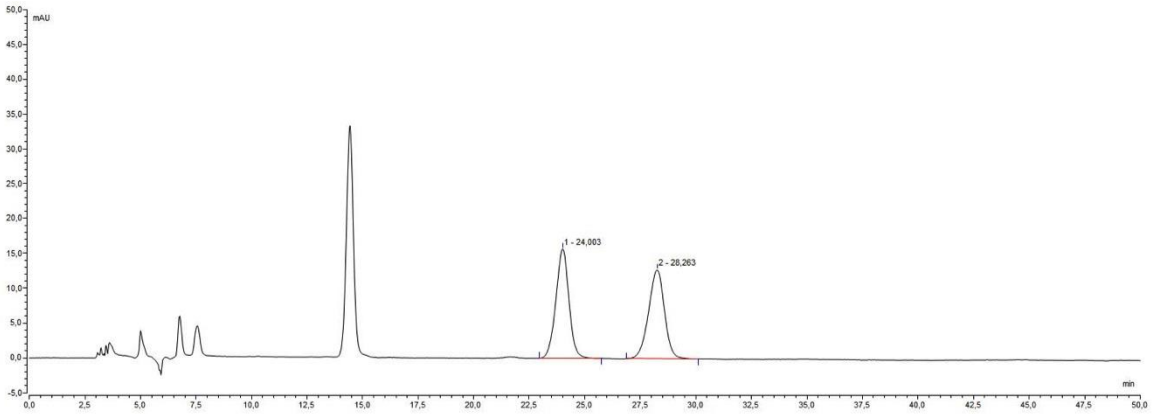
Peak Name	Retention Time	Rel.Area
	min	%
1	24,01	53,17
2	28,257	46,83

Following the general procedure D. HPLC analysis of the crude residue indicated a ratio indole/**18d** of 15:85 and an enantiomeric excess of (-) 74 [Chiralpak IA column, 100 bar, T = 20 °C, *n*-Heptane (+ 0.1% diethylamine)/EtOH (+ 0.1% diethylamine) = 95:5, 1 mL/min, λ = 300 nm, t_R = 23.990 min and t_R = 28.273 min].



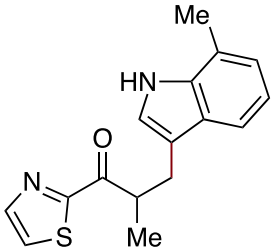
Peak Name	Retention Time	Rel.Area
	min	%
1	23,99	86,89
2	28,273	13,11

Following the general procedure E. HPLC analysis of the crude residue indicated a ratio indole/**18d** of 35:65 and an enantiomeric excess of 0 [Chiralpak IA column, 100 bar, T = 20 °C, *n*-Heptane (+ 0.1% diethylamine)/EtOH (+ 0.1% diethylamine) = 95:5, 1 mL/min, λ = 300 nm, t_R = 24.003 min and t_R = 28.263 min].

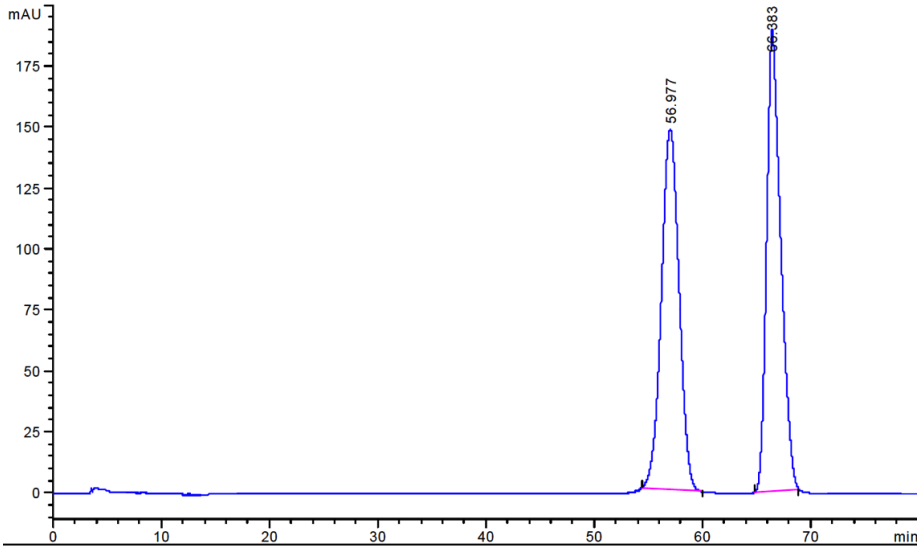


Peak Name	Retention Time	Rel.Area
	min	%
1	24,003	50,27
2	28,263	49,73

e. HPLC chromatograms of compound (18e)

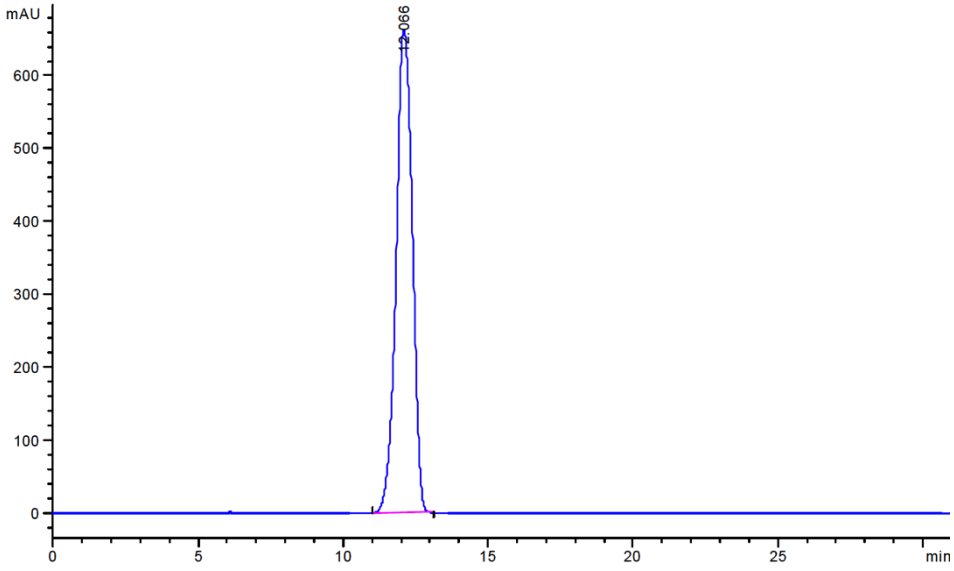


Racemic [Chiralpak IA column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 98:2, 1 mL/min, λ = 280 nm, t_R = 56.977 min and t_R = 66.383 min].

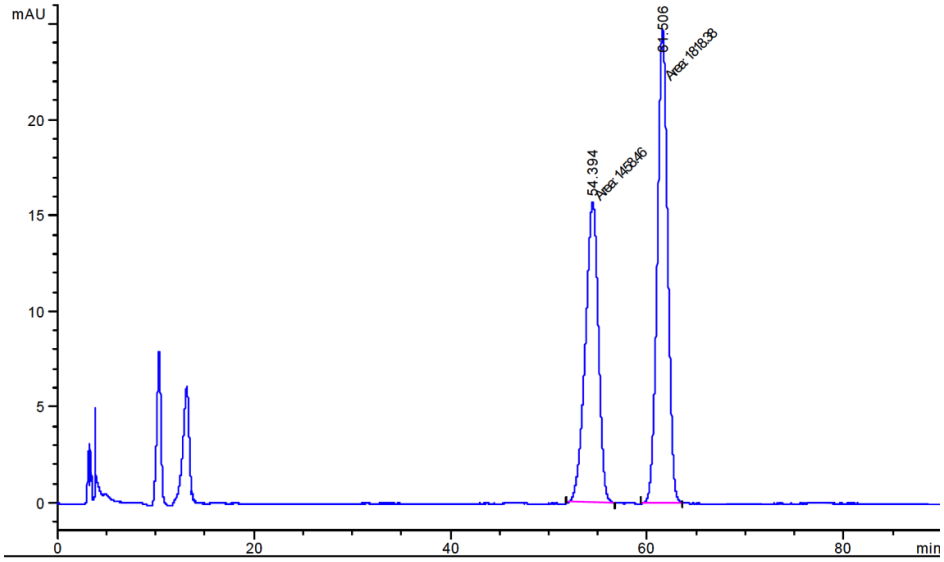


Peak	Retention Time	Rel. Area
	min	%
1	56.977	49.5647
2	66.383	50.4353

Indole [Chiralpak IA column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 98:2, 1 mL/min, λ = 280 nm, t_R = 12.066 min].

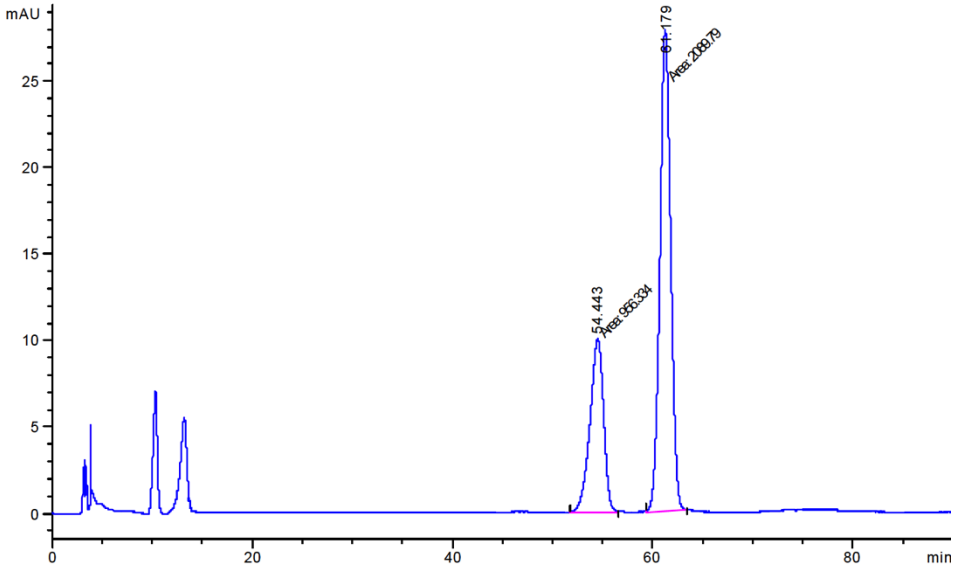


Following the general procedure A. HPLC analysis of the crude residue indicated a ratio indole/**18e** of 8:92 and an enantiomeric excess of (+) 11 [Chiralpak IA column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 98:2, 1 mL/min, λ = 280 nm, t_R = 54.394 min and t_R = 61.506 min].



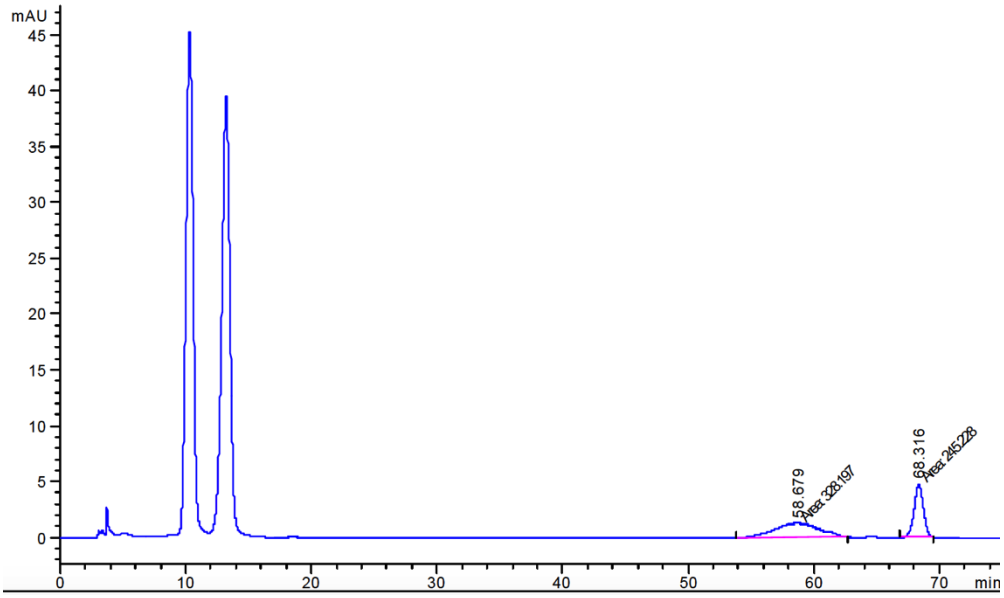
Peak	Retention Time	Rel. Area
	min	%
1	54.394	44.5081
2	61.506	55.4919

Following the general procedure B. HPLC analysis of the crude residue indicated a ratio indole/**18e** of 8:92 and an enantiomeric excess of (+) 37 [Chiralpak IA column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 98:2, 1 mL/min, λ = 280 nm, t_R = 54.443 min and t_R = 61.179 min].



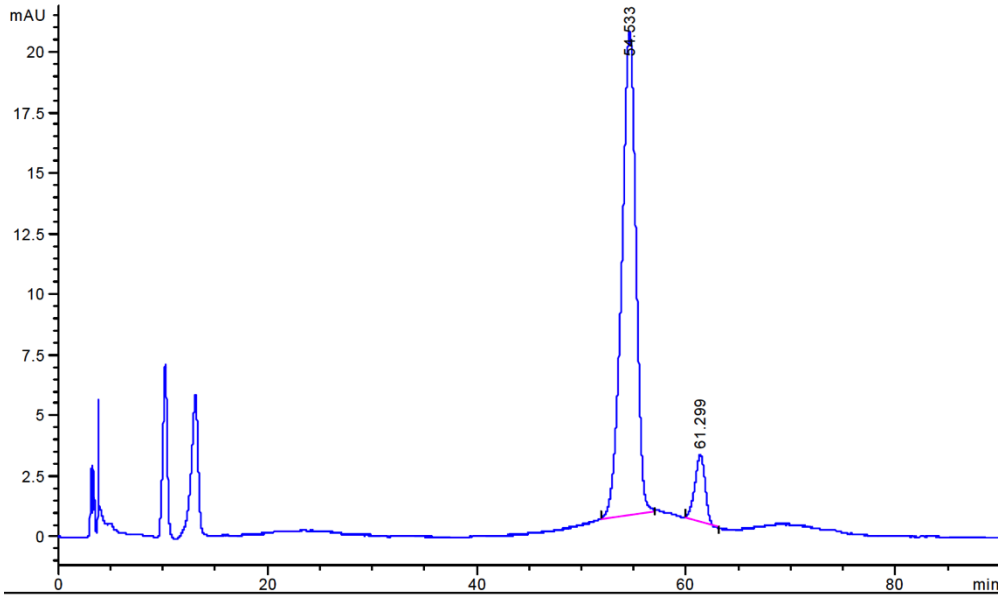
Peak	Retention Time	Rel. Area
	min	%
1	54.443	31.3951
2	61.179	68.6049

Following the general procedure C. HPLC analysis of the crude residue indicated a ratio indole/**18e** of 75:25 and an enantiomeric excess of (-) 14 [Chiralpak IA column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 98:2, 1 mL/min, λ = 280 nm, t_R = 58.679 min and t_R = 68.316 min].



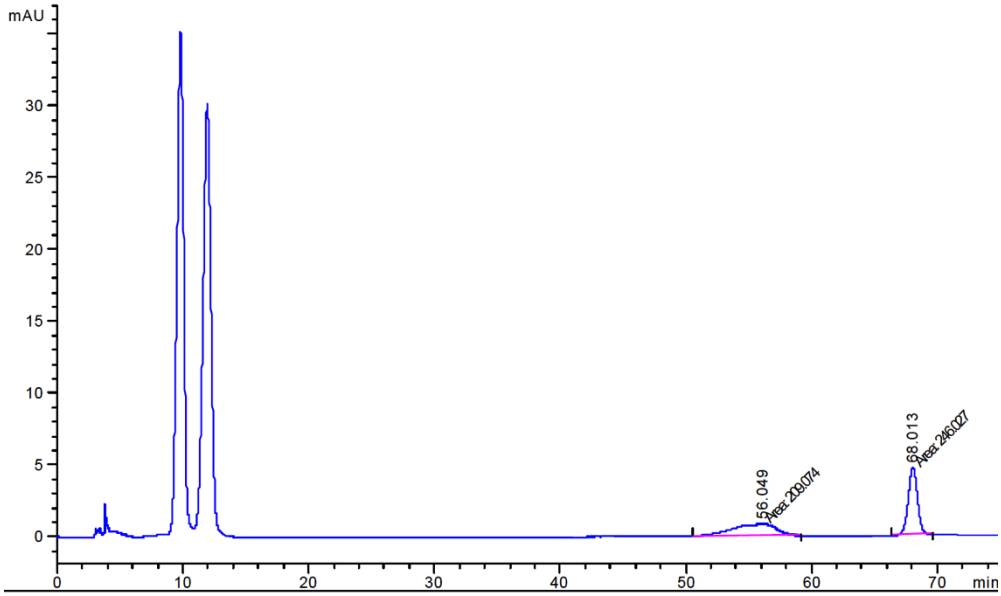
Peak	Retention Time	Rel. Area
	min	%
1	58.679	57.2345
2	68.316	42.7655

Following the general procedure D. HPLC analysis of the crude residue indicated a ratio indole/**18e** of 12:88 and an enantiomeric excess of (-) 82 [Chiralpak IA column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 98:2, 1 mL/min, λ = 280 nm, t_R = 54.533 min and t_R = 61.299 min].



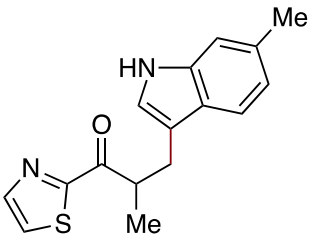
Peak	Retention Time	Rel. Area
	min	%
1	54.533	90.8116
2	61.299	9.1884

Following the general procedure E. HPLC analysis of the crude residue indicated a ratio indole/**18e** of 74:26 and an enantiomeric excess of (+) 8 [Chiralpak IA column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 98:2, 1 mL/min, λ = 280 nm, t_R = 56.049 min and t_R = 68.013 min].

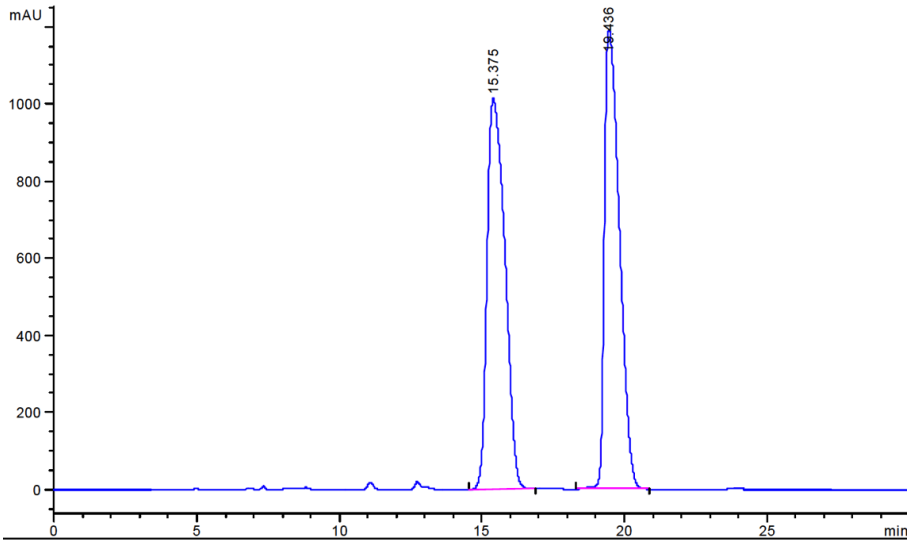


Peak	Retention Time	Rel. Area
	min	%
1	56.049	45.9401
2	68.013	54.0599

f. HPLC chromatograms of compound (18f)

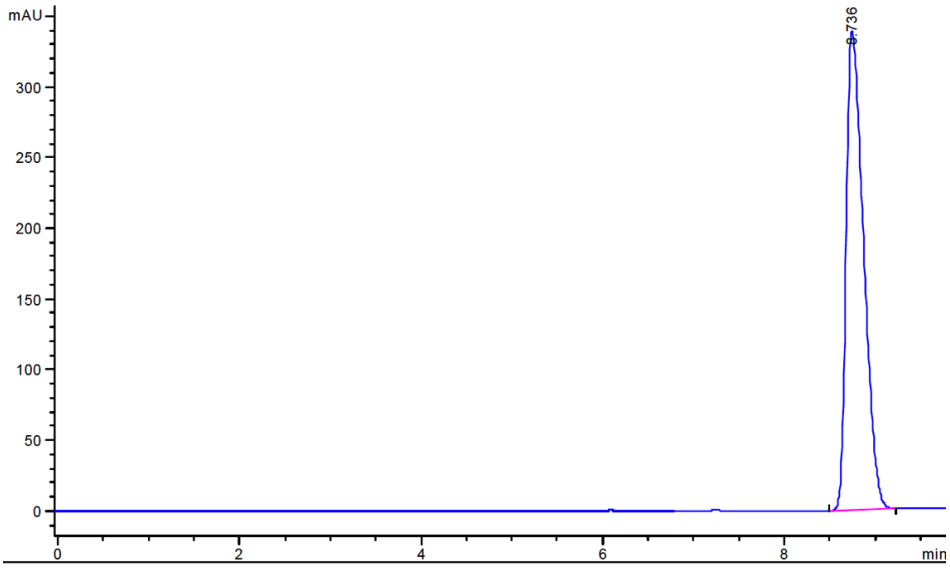


Racemic [Chiralpak IB column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 92:8, 1 mL/min, λ = 300 nm, t_R = 15.375 min and t_R = 19.436 min].

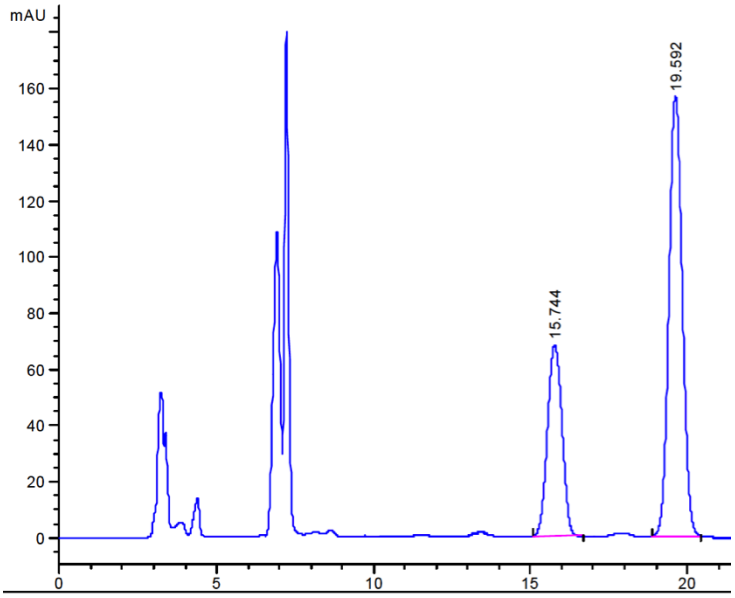


Peak	Retention Time	Rel. Area
	min	%
1	15.375	50.1345
2	19.436	49.8655

Indole [Chiralpak IB column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 92:8, 1 mL/min, λ = 300 nm, t_R = 8.736 min].

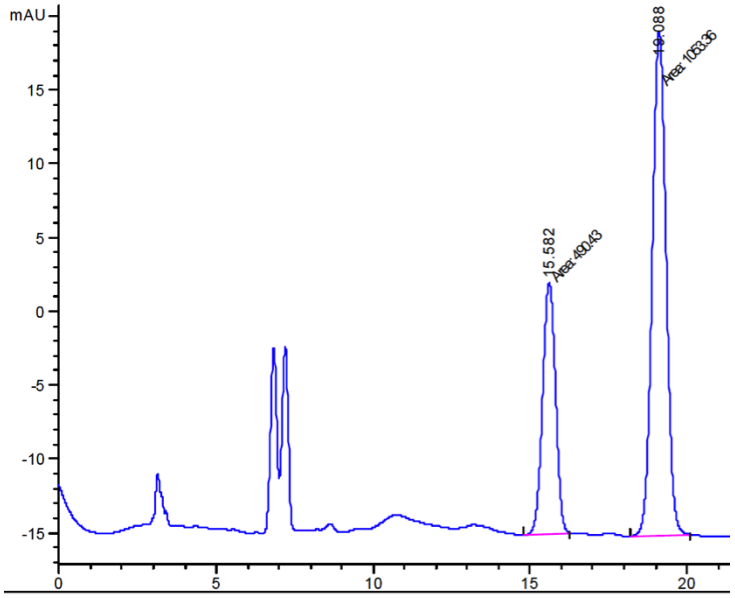


Following the general procedure A. HPLC analysis of the crude residue indicated a ratio indole/**18f** of 5:95 and an enantiomeric excess of (+) 36 [Chiralpak IB column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 92:8, 1 mL/min, λ = 300 nm, t_R = 15.744 min and t_R = 19.592 min].



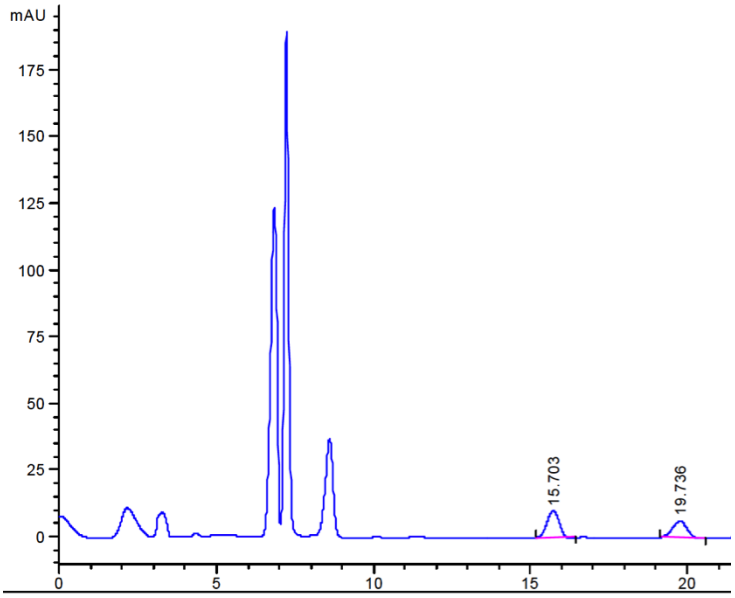
Peak	Retention Time	Rel. Area
	min	%
1	15.744	31.951
2	19.592	68.049

Following the general procedure B. HPLC analysis of the crude residue indicated a ratio indole/**18f** of 1:99 and an enantiomeric excess of (+) 36 [Chiralpak IB column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 92:8, 1 mL/min, λ = 300 nm, t_R = 15.582 min and t_R = 19.088 min].



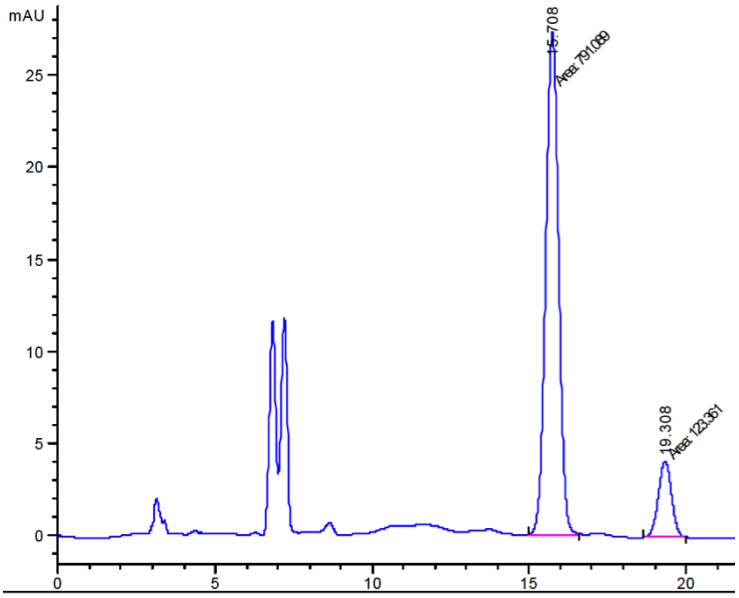
Peak	Retention Time	Rel. Area
	min	%
1	15.582	31.7679
2	19.088	68.2321

Following the general procedure C. HPLC analysis of the crude residue indicated a ratio indole/**18f** of 56:44 and an enantiomeric excess of (-) 14 [Chiralpak IB column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 92:8, 1 mL/min, λ = 300 nm, t_R = 15.703 min and t_R = 19.736 min].



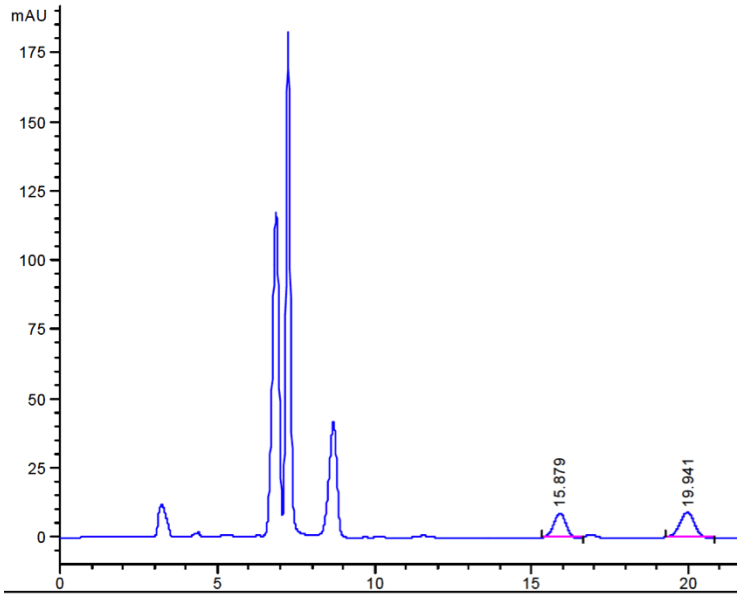
Peak	Retention Time	Rel. Area
	min	%
1	15.703	57.0111
2	19.736	42.9889

Following the general procedure D. HPLC analysis of the crude residue indicated a ratio indole/**18f** of 1:99 and an enantiomeric excess of (-) 73 [Chiralpak IB column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 92:8, 1 mL/min, λ = 300 nm, t_R = 15.708 min and t_R = 19.308 min].



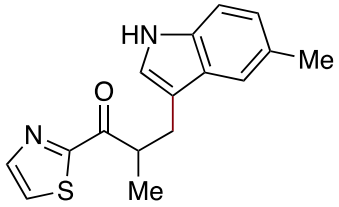
Peak	Retention Time	Rel. Area
	min	%
1	15.708	86.5098
2	19.308	13.4902

Following the general procedure E. HPLC analysis of the crude residue indicated a ratio indole/**18f** of 58:42 and an enantiomeric excess of (+) 13 [Chiralpak IB column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 92:8, 1 mL/min, λ = 300 nm, t_R = 15.879 min and t_R = 19.941 min].

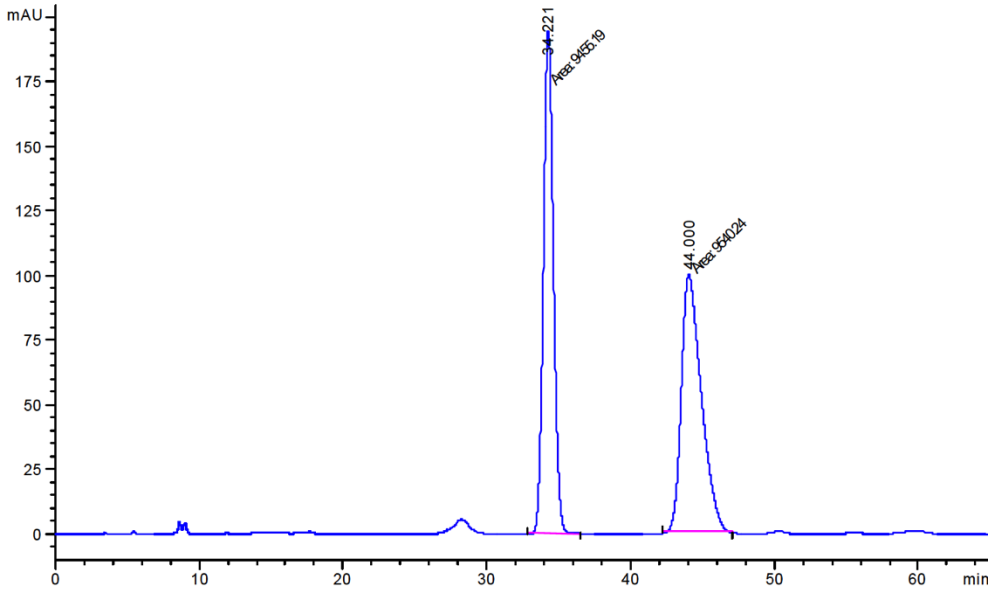


Peak	Retention Time	Rel. Area
	min	%
1	15.879	43.4994
2	19.941	56.5006

g. HPLC chromatograms of compound (18g)

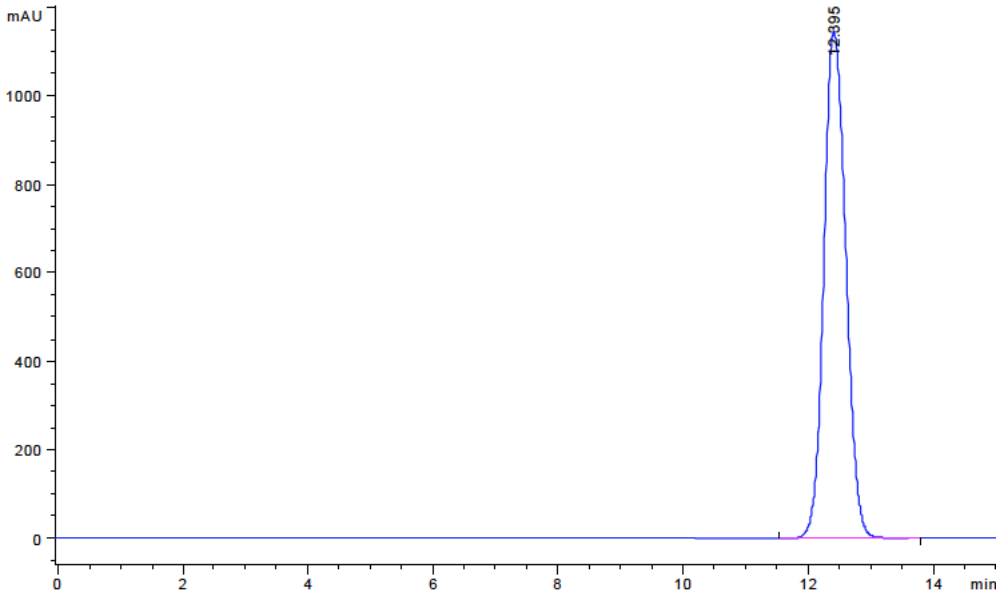


Racemic [Chiralpak IA column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 97:3,1 mL/min, λ = 280 nm, t_R = 34.221 min and t_R = 44.000 min].

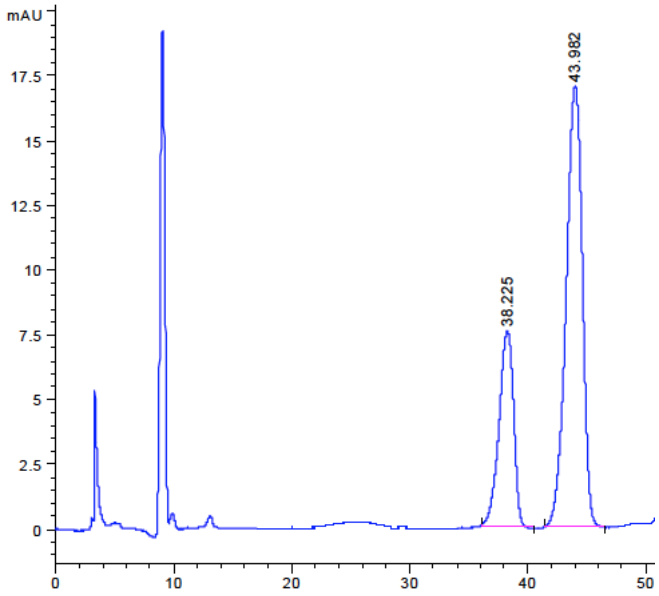


Peak	Retention Time	Rel. Area
	min	%
1	34.221	49.7761
2	44	50.2239

Indole [Chiralpak IA column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 97:3,1 mL/min, λ = 280 nm, t_R = 12.395 min].

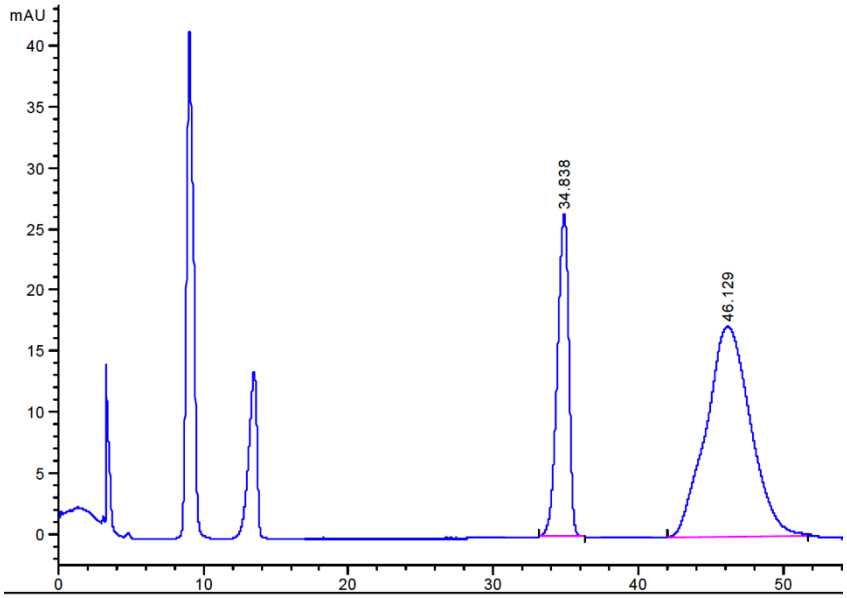


Following the general procedure A. HPLC analysis of the crude residue indicated a ratio indole/**18g** of 1:99 and an enantiomeric excess of (+) 43 [Chiralpak IA column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 97:3,1 mL/min, λ = 280 nm, t_R = 38.225 min and t_R = 43.982 min].



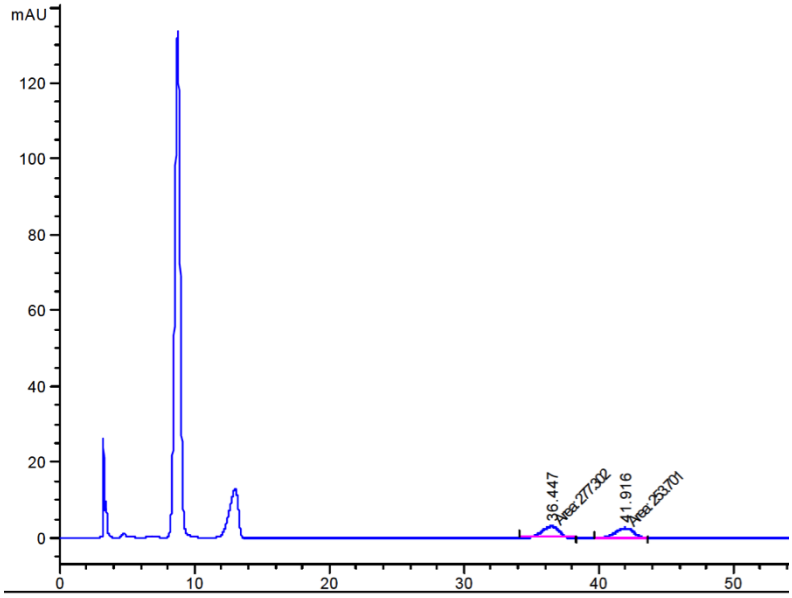
Peak	Retention Time	Rel. Area
	min	%
1	38.225	28.6195
2	43.982	71.3805

Following the general procedure B. HPLC analysis of the crude residue indicated a ratio indole/**18g** of 10:90 and an enantiomeric excess of (+) 43 [Chiralpak IA column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 97:3,1 mL/min, λ = 280 nm, t_R = 34.838 min and t_R = 46.129 min].



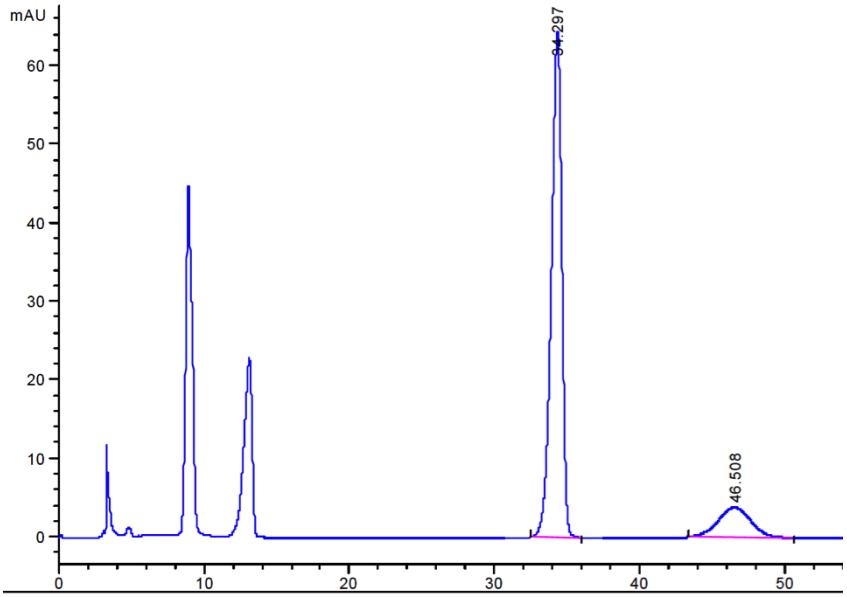
Peak	Retention Time	Rel. Area
	min	%
1	34.838	28.3881
2	46.129	71.6119

Following the general procedure C. HPLC analysis of the crude residue indicated a ratio indole/**18g** of 54:46 and an enantiomeric excess of (-) 4 [Chiralpak IA column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 97:3,1 mL/min, λ = 280 nm, t_R = 36.447 min and t_R = 41.916 min].



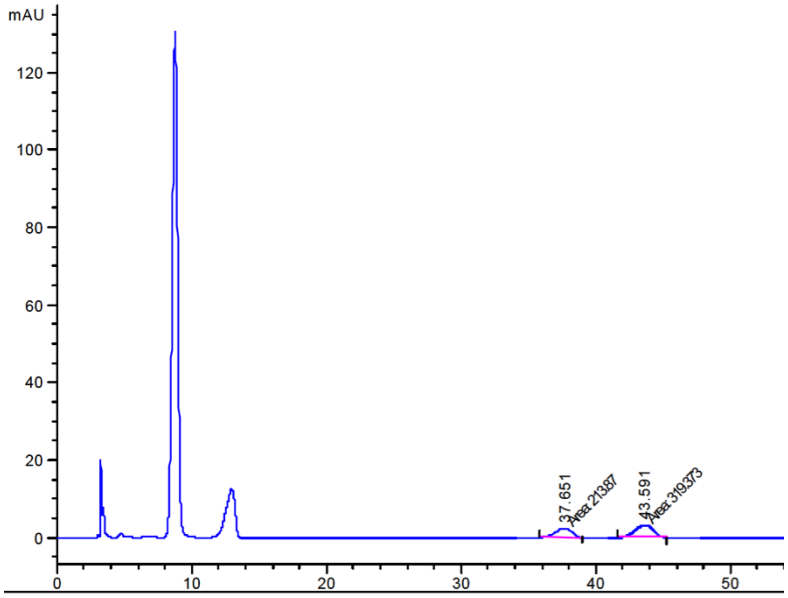
Peak	Retention Time	Rel. Area
	min	%
1	36.447	52.2224
2	41.916	47.7776

Following the general procedure D. HPLC analysis of the crude residue indicated a ratio indole/**18g** of 19:81 and an enantiomeric excess of (-) 67 [Chiralpak IA column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 97:3,1 mL/min, λ = 280 nm, t_R = 34.297 min and t_R = 46.508 min].



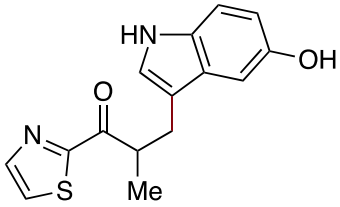
Peak	Retention Time	Rel. Area
	min	%
1	34.297	83.7295
2	46.508	16.2705

Following the general procedure E. HPLC analysis of the crude residue indicated a ratio indole/**18g** of 50:50 and an enantiomeric excess of (+) 20 [Chiralpak IA column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 97:3,1 mL/min, λ = 280 nm, t_R = 37.651 min and t_R = 43.591 min].

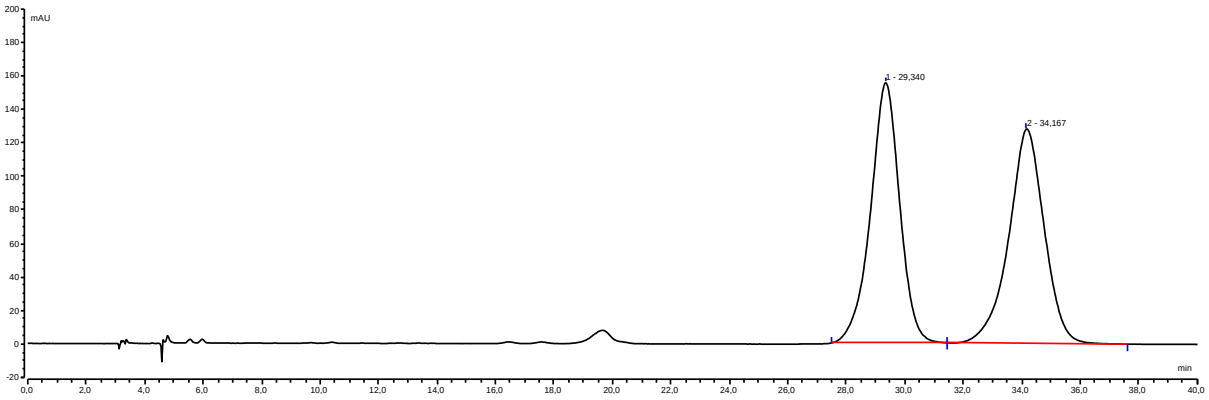


Peak	Retention Time	Rel. Area
	min	%
1	37.651	40.1075
2	43.591	59.8925

h. HPLC chromatograms of compound (18h)

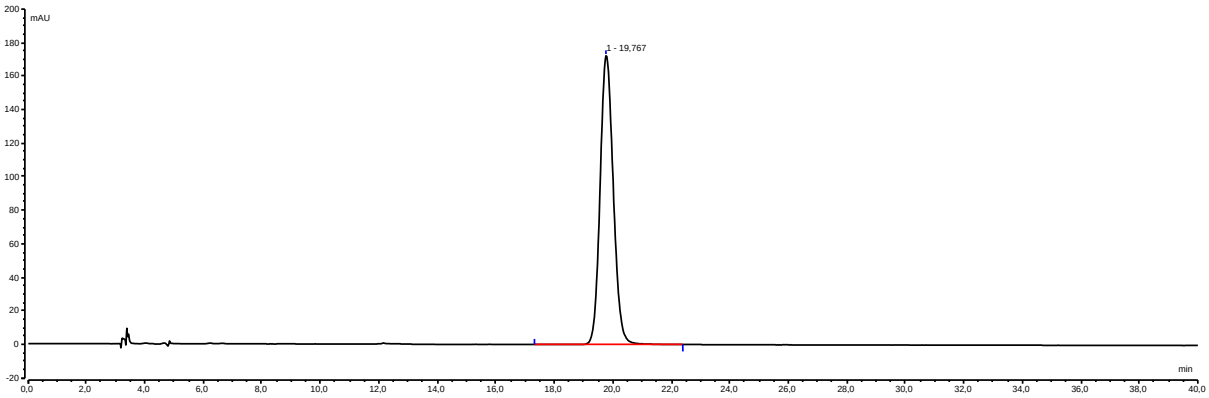


Racemic [Chiralpak IA column, 100 bar, T = 25 °C, *n*-Heptane (+ 0.1% diethylamine)/EtOH (+ 0.1% diethylamine) = 90:10, 1 mL/min, λ = 300 nm, t_R = 29.340 min and t_R = 34.167 min].



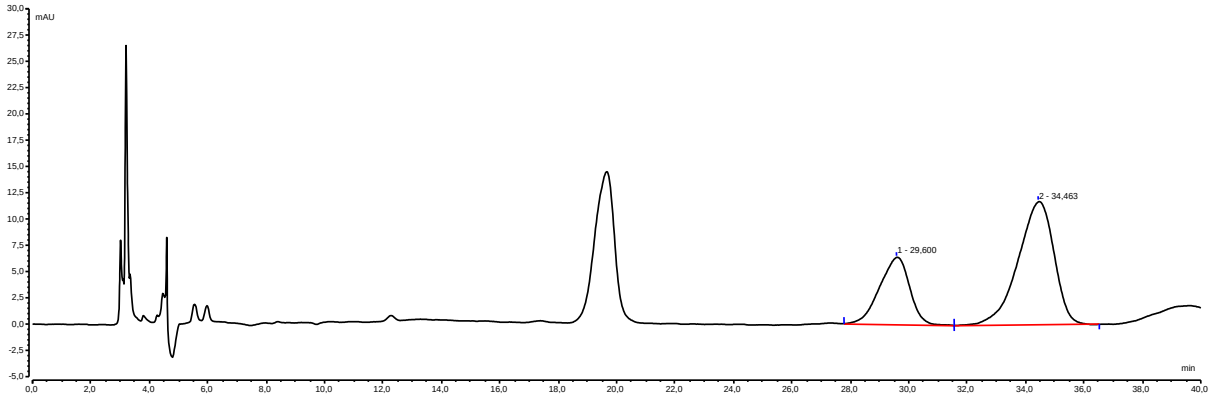
Peak Name	Retention Time	Rel.Area
	min	%
1	29,34	49,91
2	34,167	50,09

Indole [Chiralpak IA column, 100 bar, T = 25 °C, *n*-Heptane (+ 0.1% diethylamine)/EtOH (+ 0.1% diethylamine) = 90:10, 1 mL/min, λ = 300 nm, t_R = 19.767 min].



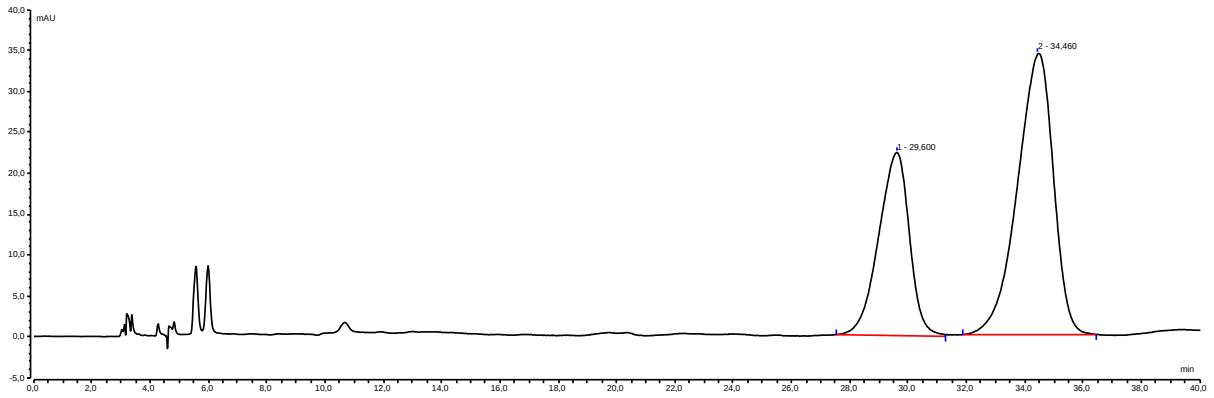
Peak Name	Retention Time	Rel.Area
	min	%
1	19,767	100

Following the general procedure A. HPLC analysis of the crude residue indicated a ratio indole/**18h** of 17:83 and an enantiomeric excess of (+) 37 [Chiralpak IA column, 100 bar, T = 25 °C, *n*-Heptane (+ 0.1% diethylamine)/EtOH (+ 0.1% diethylamine) = 90:10, 1 mL/min, λ = 300 nm, t_R = 29.600 min and t_R = 34.463 min].



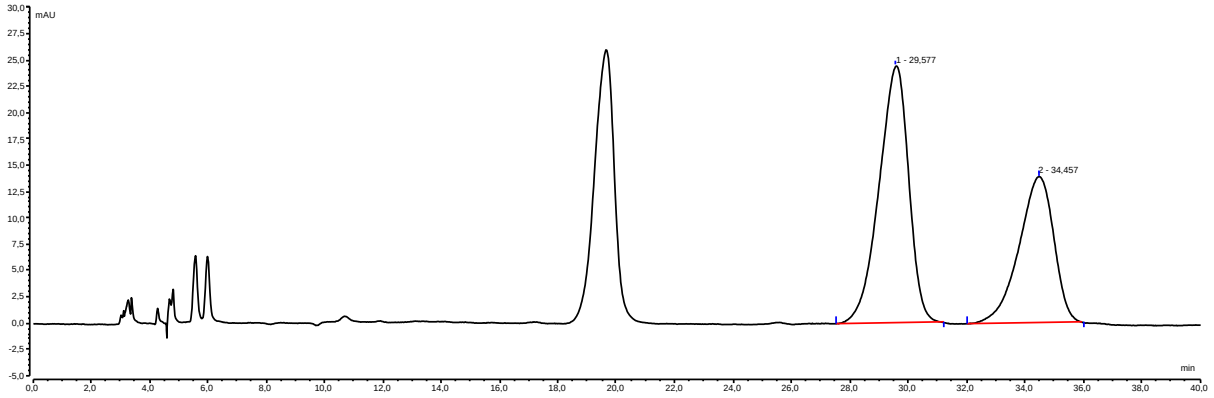
Peak Name	Retention Time	Rel.Area
	min	%
1	29,6	31,26
2	34,463	68,74

Following the general procedure B. HPLC analysis of the crude residue indicated a ratio indole/**18h** of > 1:99 and an enantiomeric excess of (+) 29 [Chiralpak IA column, 100 bar, T = 25 °C, *n*-Heptane (+ 0.1% diethylamine)/EtOH (+ 0.1% diethylamine) = 90:10, 1 mL/min, λ = 300 nm, t_R = 29.600 min and t_R = 34.460 min].



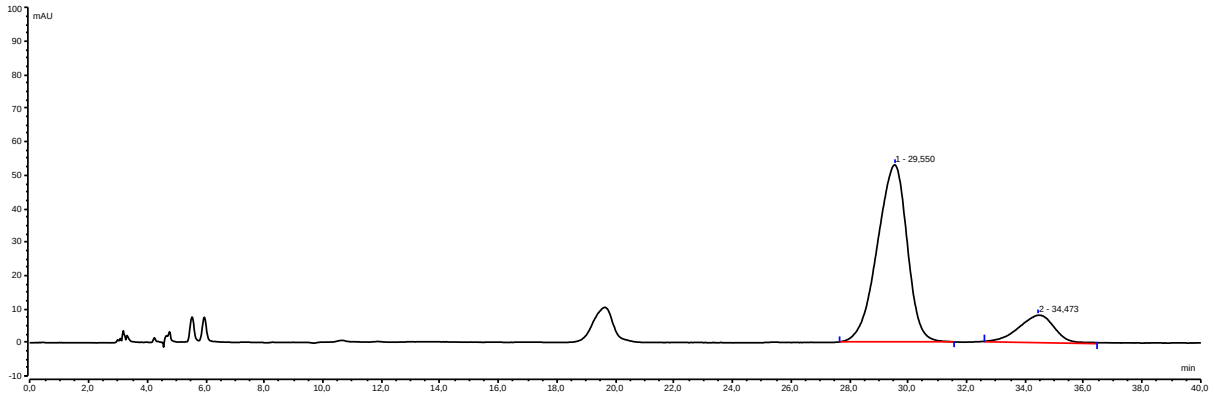
Peak Name	Retention Time	Rel.Area
	min	%
1	29,6	35,43
2	34,46	64,57

Following the general procedure C. HPLC analysis of the crude residue indicated a ratio indole/**18h** of 29:71 and an enantiomeric excess of (-) 20 [Chiralpak IA column, 100 bar, T = 25 °C, *n*-Heptane (+ 0.1% diethylamine)/EtOH (+ 0.1% diethylamine) = 90:10, 1 mL/min, λ = 300 nm, t_R = 29.577 min and t_R = 34.457 min].



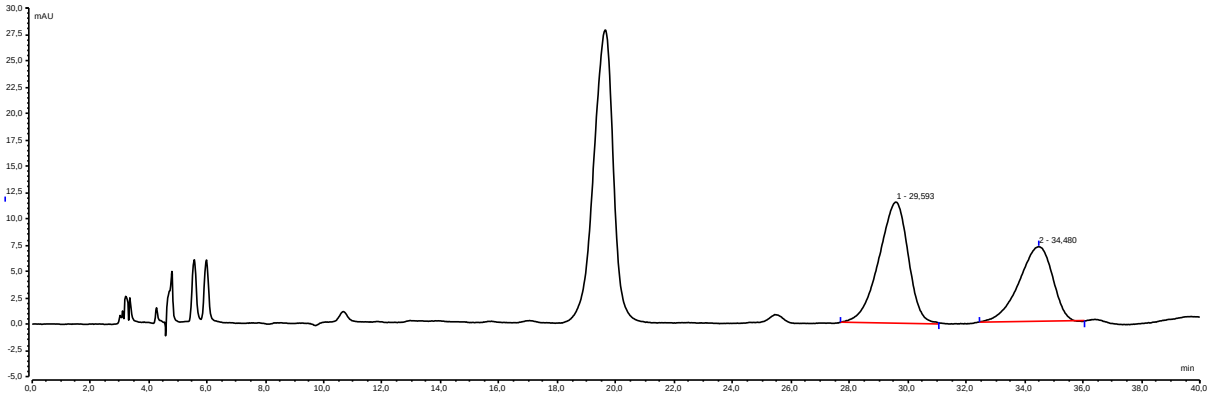
Peak Name	Retention Time	Rel.Area
	min	%
1	29,577	59,99
2	34,457	40,01

Following the general procedure D. HPLC analysis of the crude residue indicated a ratio indole/**18h** of 12:88 and an enantiomeric excess of (-) 70 [Chiralpak IA column, 100 bar, T = 25 °C, *n*-Heptane (+ 0.1% diethylamine)/EtOH (+ 0.1% diethylamine) = 90:10, 1 mL/min, λ = 300 nm, t_R = 29.550 min and t_R = 34.473 min].



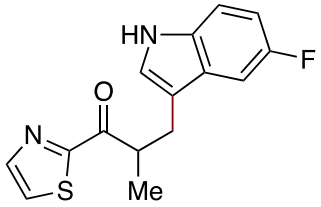
Peak Name	Retention Time	Rel.Area
	min	%
1	29,55	85,06
2	34,473	14,94

Following the general procedure E. HPLC analysis of the crude residue indicated a ratio indole/**18h** of 47:53 and an enantiomeric excess of (-) 15 [Chiralpak IA column, 100 bar, T = 25 °C, *n*-Heptane (+ 0.1% diethylamine)/EtOH (+ 0.1% diethylamine) = 90:10, 1 mL/min, λ = 300 nm, t_R = 29.583 min and t_R = 34.480 min].

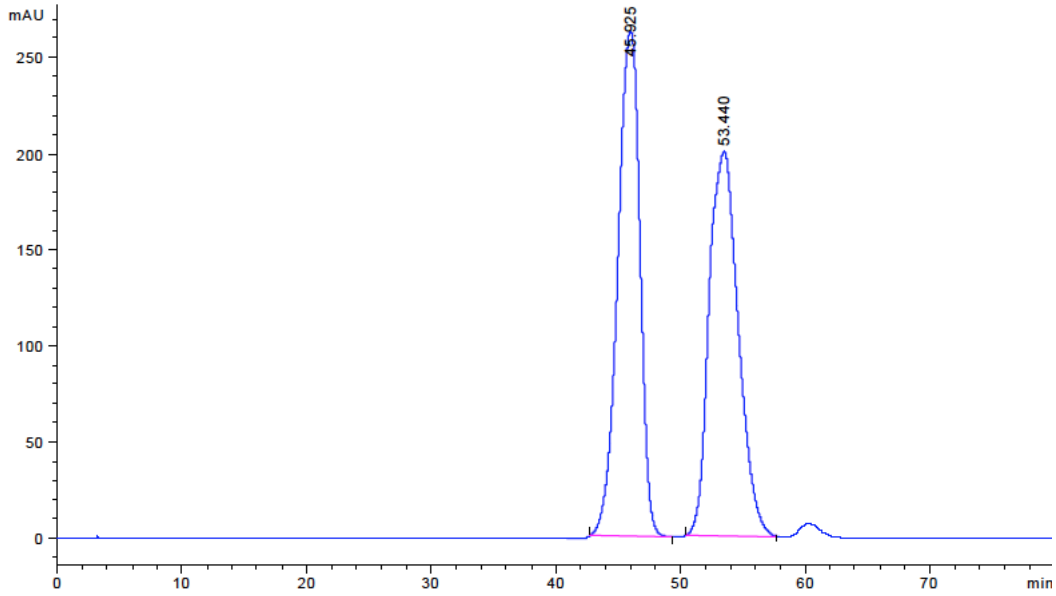


Peak Name	Retention Time	Rel.Area
	min	%
1	29,6	57,58
2	34,487	42,42

i. HPLC chromatograms of compound (18i)

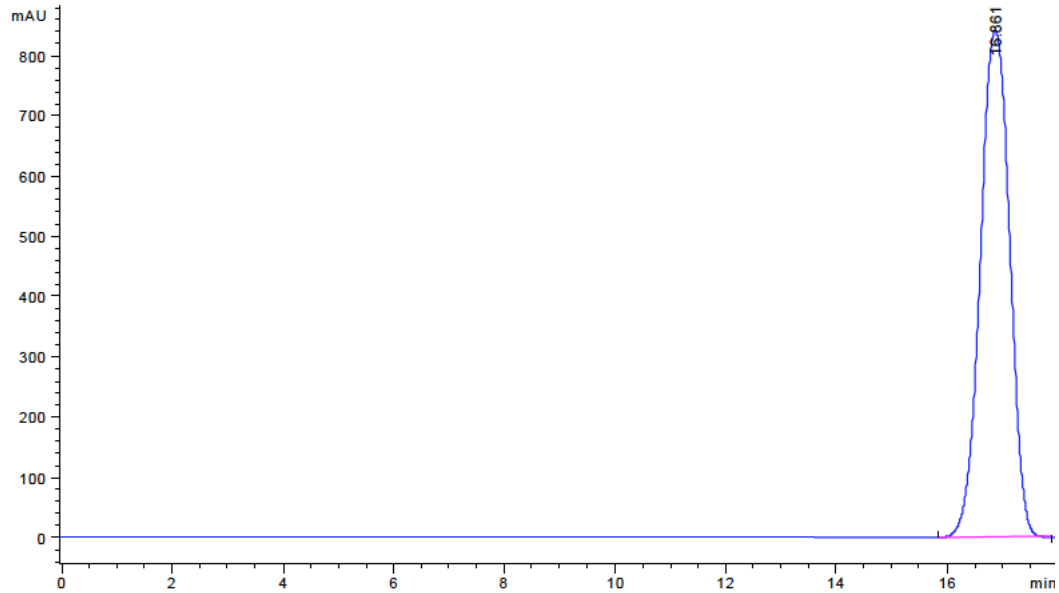


Racemic [Chiralpak IA column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 97:3, 1 mL/min, λ = 280 nm, t_R = 45.925 min and t_R = 53.440 min].

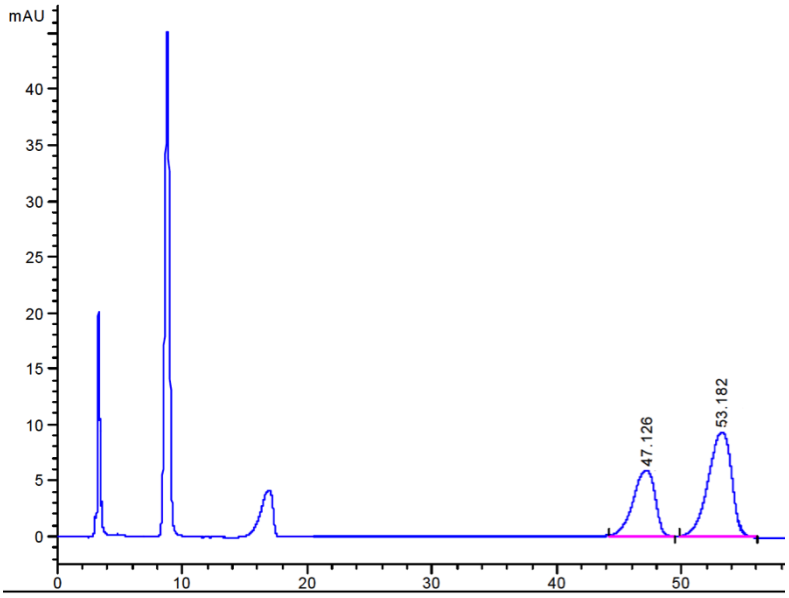


Peak	Retention Time	Rel. Area
	min	%
1	45.925	50.0692
2	53.44	49.9308

Indole [Chiralpak IA column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 97:3, 1 mL/min, λ = 280 nm, t_R = 16.861 min].

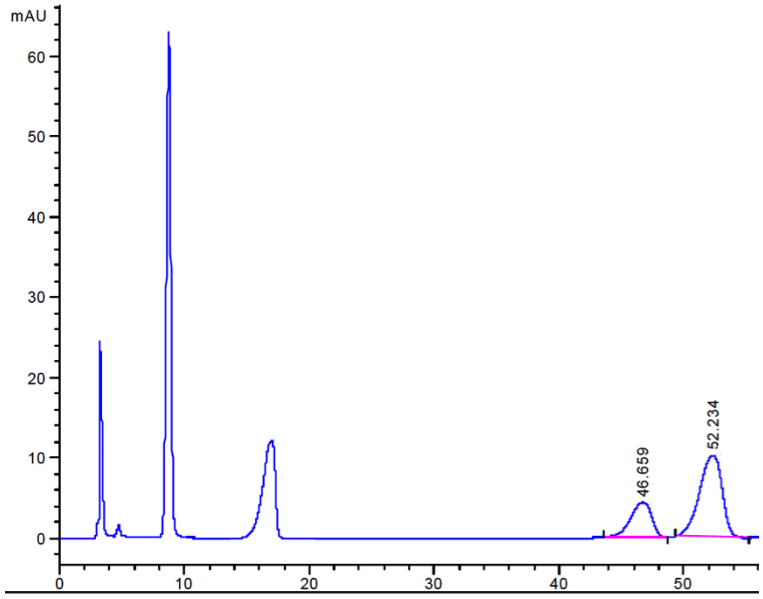


Following the general procedure A. HPLC analysis of the crude residue indicated a ratio indole/**18i** of 13:87 and an enantiomeric excess of (+) 27 [Chiralpak IA column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 97:3, 1 mL/min, λ = 280 nm, t_R = 47.126 min and t_R = 53.182 min].



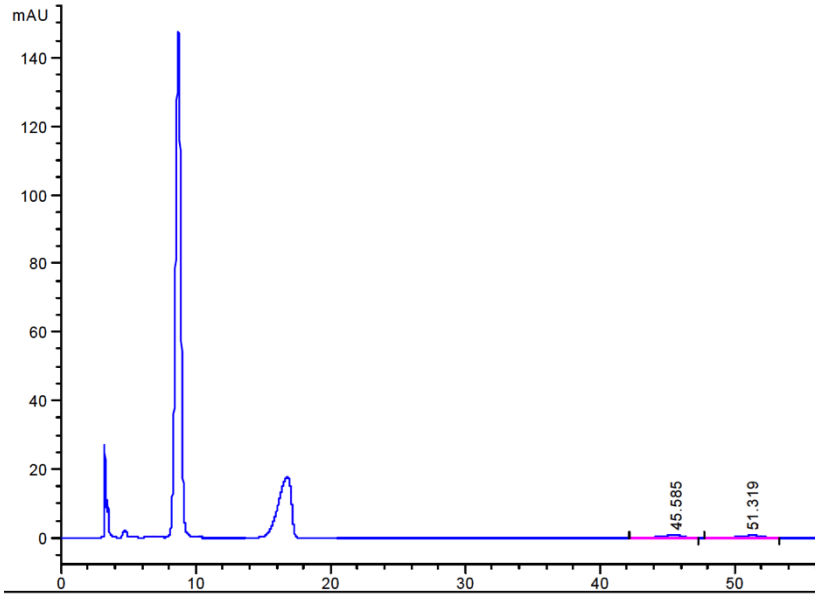
Peak	Retention Time	Rel. Area
	min	%
1	47.126	36.6143
2	53.182	63.3857

Following the general procedure B. HPLC analysis of the crude residue indicated a ratio indole/**18i** of 32:68 and an enantiomeric excess of (+) 42 [Chiralpak IA column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 97:3, 1 mL/min, λ = 280 nm, t_R = 46.659 min and t_R = 52.234 min].



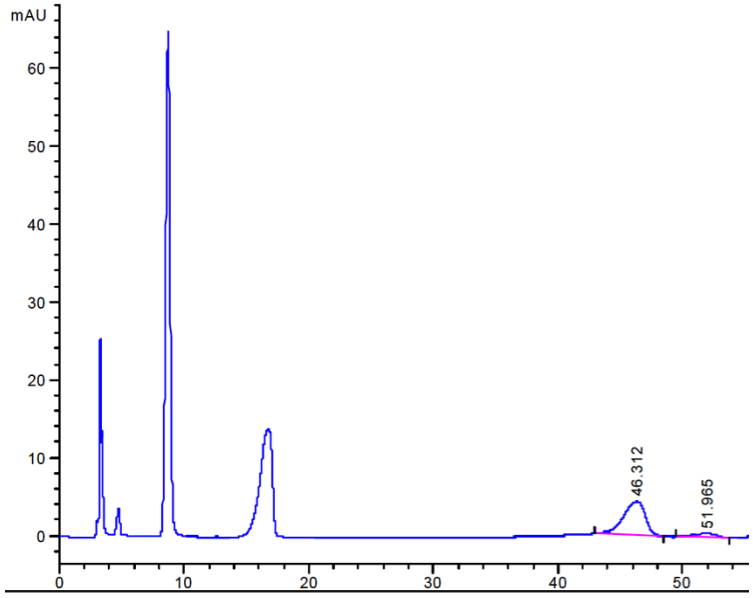
Peak	Retention Time	Rel. Area
	min	%
1	46.659	29.0707
2	52.234	70.9293

Following the general procedure C. HPLC analysis of the crude residue indicated a ratio indole/**18i** of 85:15 and an enantiomeric excess of (-) 2 [Chiralpak IA column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 97:3, 1 mL/min, λ = 280 nm, t_R = 45.585 min and t_R = 51.319 min].



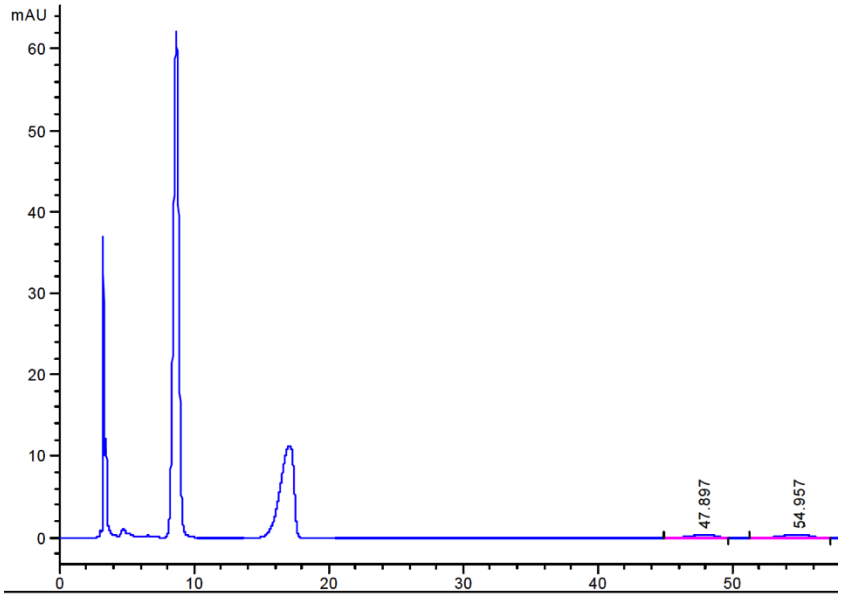
Peak	Retention Time	Rel. Area
	min	%
1	45.585	51.2158
2	51.319	48.7842

Following the general procedure D. HPLC analysis of the crude residue indicated a ratio indole/**18i** of 61:39 and an enantiomeric excess of (-) 80 [Chiralpak IA column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 97:3, 1 mL/min, λ = 280 nm, t_R = 46.312 min and t_R = 51.965 min].



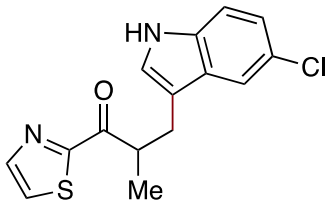
Peak	Retention Time	Rel. Area
	min	%
1	46.312	89.9368
2	51.965	10.0632

Following the general procedure E. HPLC analysis of the crude residue indicated a ratio indole/**18i** of 87:13 and an enantiomeric excess of (+) 8 [Chiralpak IA column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 97:3, 1 mL/min, λ = 280 nm, t_R = 47.897 min and t_R = 54.957 min].

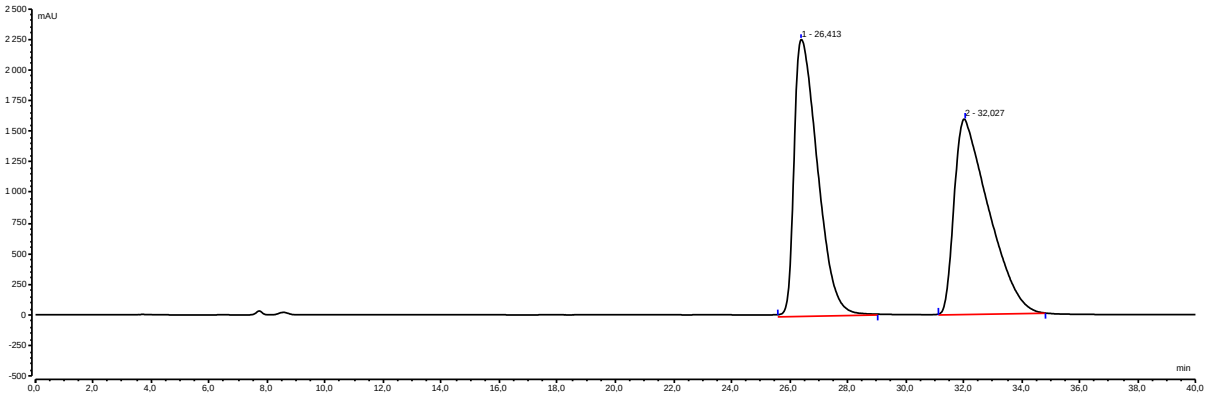


Peak	Retention Time	Rel. Area
	min	%
1	47.897	46.074
2	54.957	53.926

j. HPLC chromatograms of compound (18j)

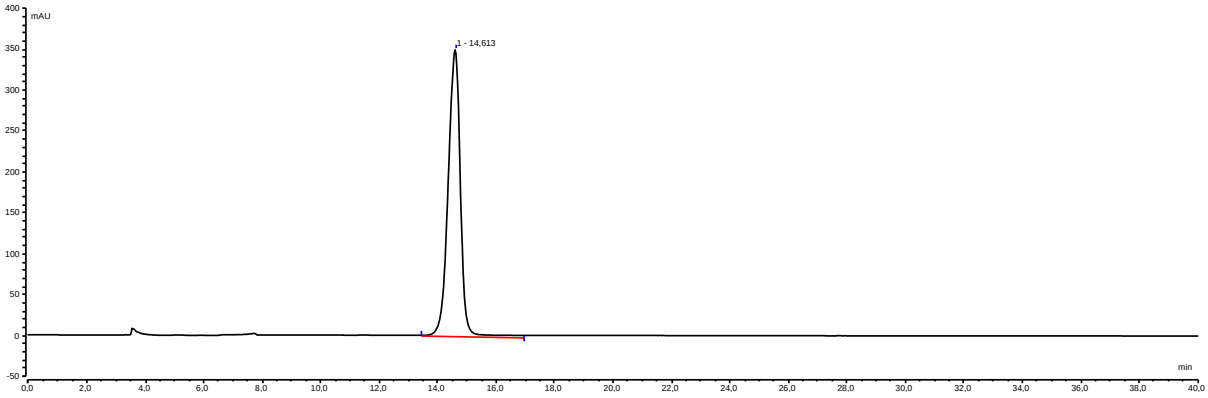


Racemic [Chiralpak IA column, 100 bar, T = 20 °C, *n*-Heptane (+ 0.1% diethylamine)/EtOH (+ 0.1% diethylamine) = 97:3, 1 mL/min, λ = 300 nm, t_R = 26.413 min and t_R = 32.027 min].



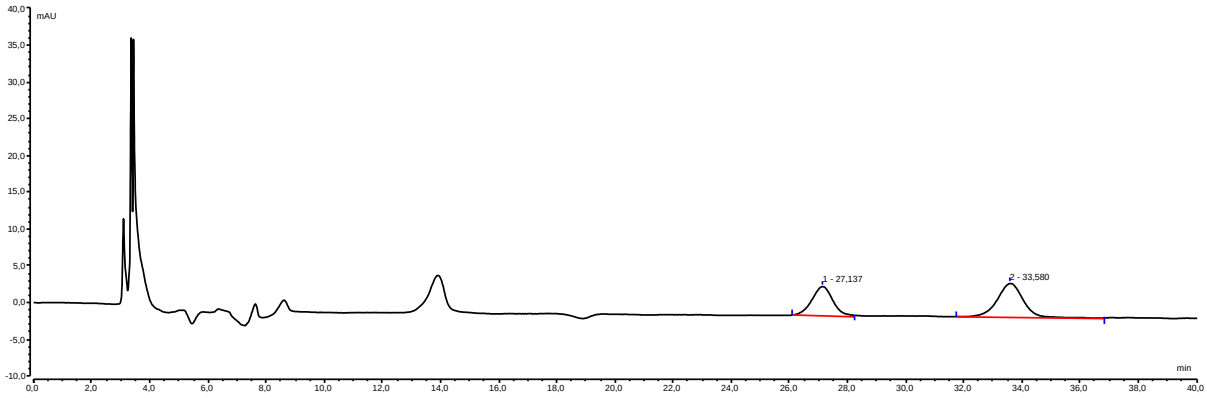
Peak Name	Retention Time	Rel.Area
	min	%
1	26,413	48,76
2	32,027	51,24

Indole [Chiralpak IA column, 100 bar, T = 20 °C, *n*-Heptane (+ 0.1% diethylamine)/EtOH (+ 0.1% diethylamine) = 97:3, 1 mL/min, λ = 300 nm, t_R = 14.613 min].



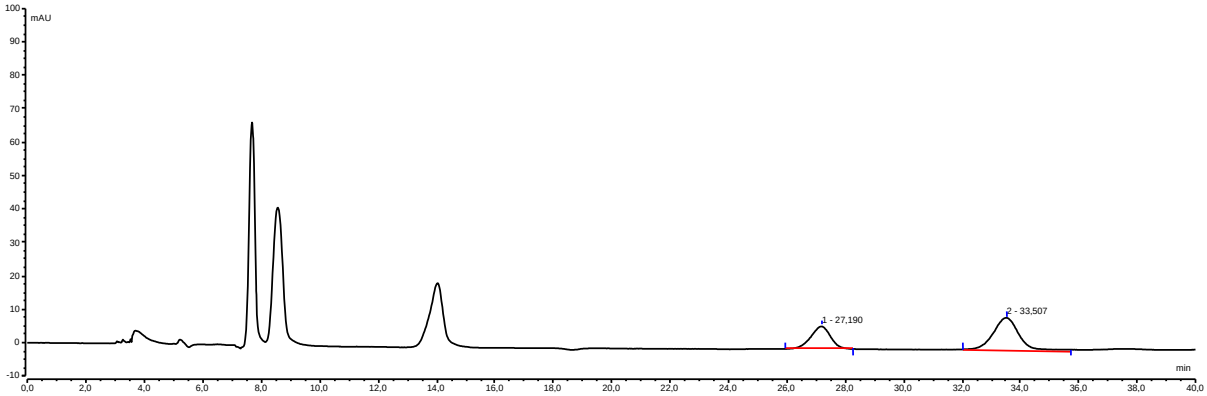
Peak Name	Retention Time	Rel.Area
	min	%
1	14,613	100

Following the general procedure A. HPLC analysis of the crude residue indicated a ratio indole/**18j** of 31:69 and an enantiomeric excess of (+) 19 [Chiralpak IA column, 100 bar, T = 20 °C, *n*-Heptane (+ 0.1% diethylamine)/EtOH (+ 0.1% diethylamine) = 97:3, 1 mL/min, λ = 300 nm, t_R = 27.137 min and t_R = 33.580 min].



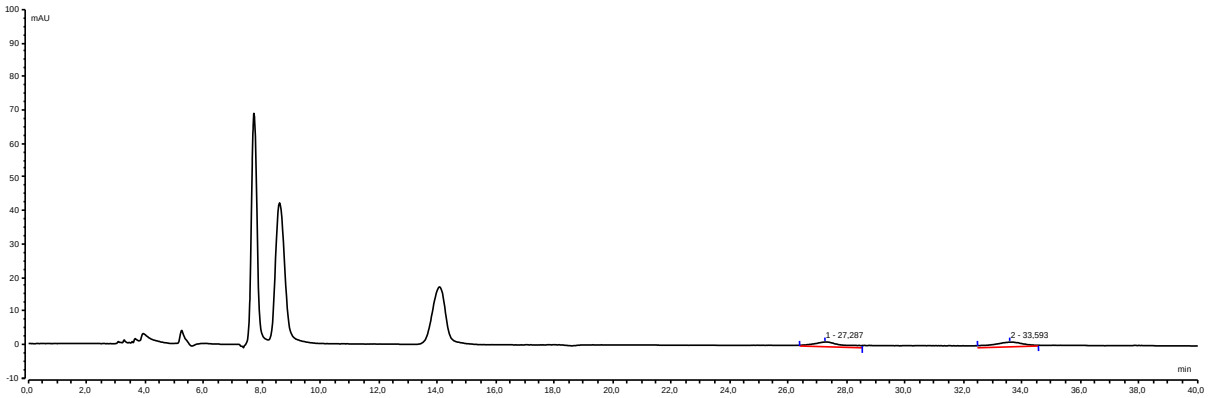
Peak Name	Retention Time	Rel.Area
	min	%
1	27,137	40,52
2	33,58	59,48

Following the general procedure B. HPLC analysis of the crude residue indicated a ratio indole/**18j** of 53:47 and an enantiomeric excess of (+) 4 [Chiralpak IA column, 100 bar, T = 20 °C, *n*-Heptane (+ 0.1% diethylamine)/EtOH (+ 0.1% diethylamine) = 97:3, 1 mL/min, λ = 300 nm, t_R = 27.190 min and t_R = 33.507 min].



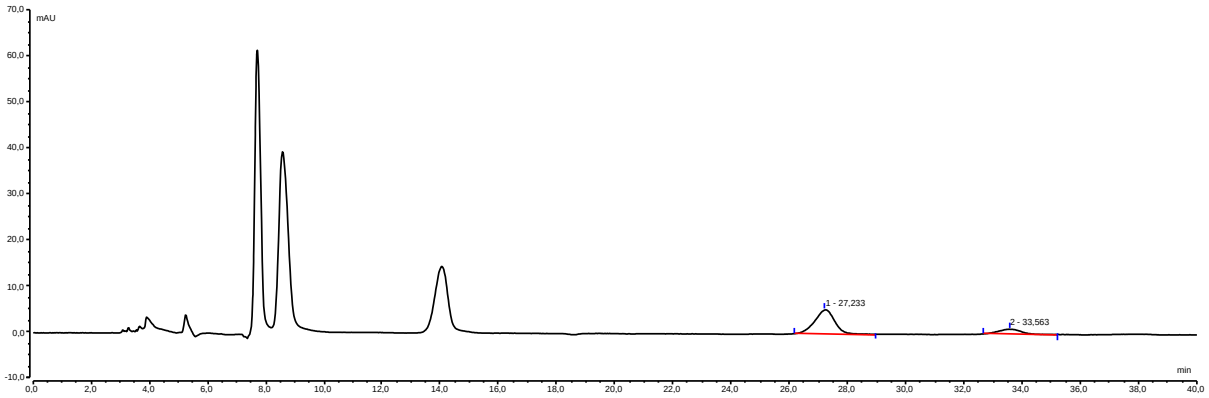
Peak Name	Retention Time	Rel.Area
	min	%
1	33,517	47,83
2	37,587	52,17

Following the general procedure C. HPLC analysis of the crude residue indicated a ratio indole/**18j** of 89:11 and an enantiomeric excess of (+) 27 [Chiralpak IA column, 100 bar, T = 20 °C, *n*-Heptane (+ 0.1% diethylamine)/EtOH (+ 0.1% diethylamine) = 97:3, 1 mL/min, λ = 300 nm, t_R = 27.287 min and t_R = 33.593 min].



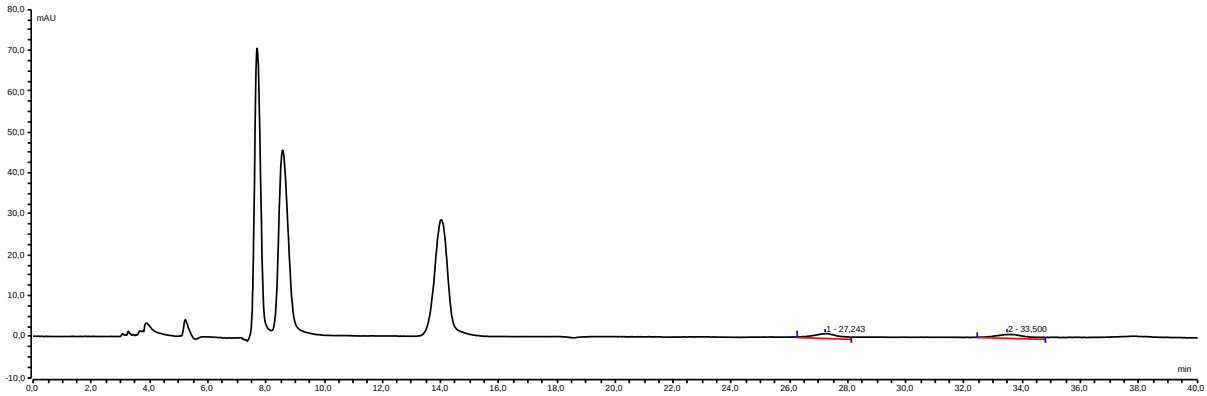
Peak Name	Retention Time	Rel.Area
	min	%
1	27,287	36,53
2	33,593	63,47

Following the general procedure D. HPLC analysis of the crude residue indicated a ratio indole/**18j** of 68:32 and an enantiomeric excess of (-) 63 [Chiralpak IA column, 100 bar, T = 20 °C, *n*-Heptane (+ 0.1% diethylamine)/EtOH (+ 0.1% diethylamine) = 97:3, 1 mL/min, λ = 300 nm, t_R = 27.233 min and t_R = 33.563 min].



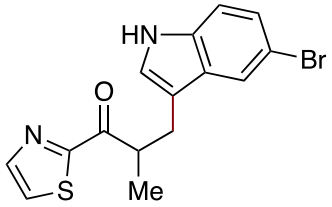
Peak Name	Retention Time	Rel.Area
	min	%
1	27,233	81,28
2	33,563	18,72

Following the general procedure E. HPLC analysis of the crude residue indicated a ratio indole/**18j** of 95:5 and an enantiomeric excess of (+) 7 [Chiralpak IA column, 100 bar, T = 20 °C, *n*-Heptane (+ 0.1% diethylamine)/EtOH (+ 0.1% diethylamine) = 97:3, 1 mL/min, λ = 300 nm, t_R = 27.243 min and t_R = 33.500 min].

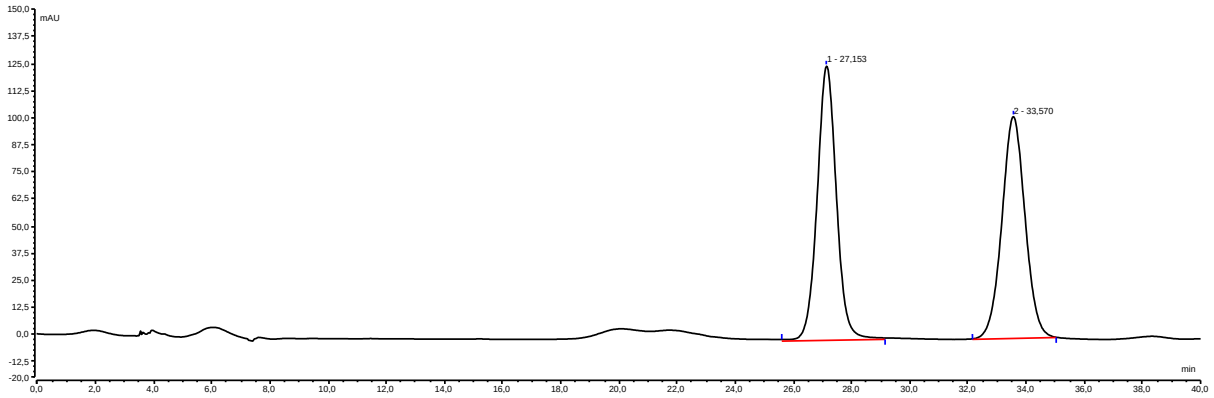


Peak Name	Retention Time	Rel.Area
	min	%
1	27,243	46,31
2	33,5	53,69

k. HPLC chromatograms of compound (18k)

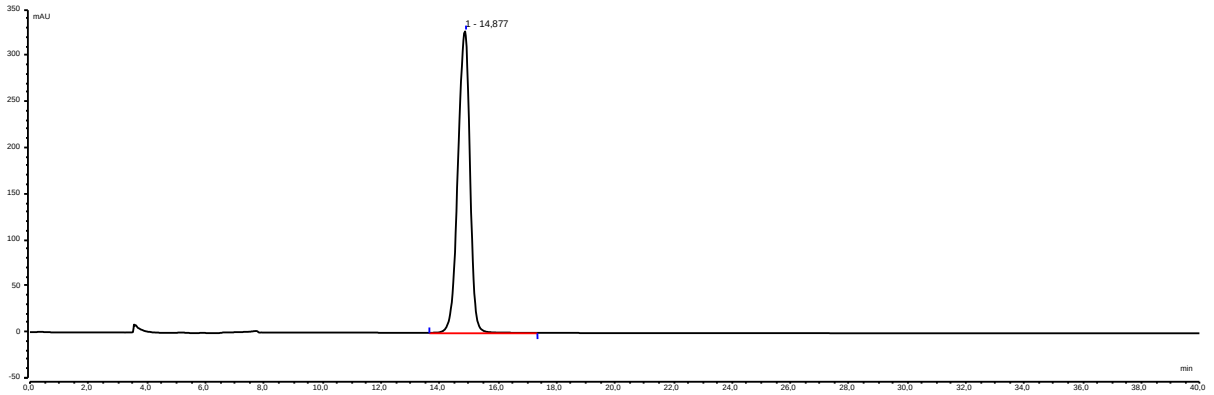


Racemic [Chiralpak IA column, 100 bar, T = 20 °C, *n*-Heptane (+ 0.1% diethylamine)/EtOH (+ 0.1% diethylamine) = 97:3, 1 mL/min, λ = 300 nm, t_R = 27.153 min and t_R = 33.570 min].



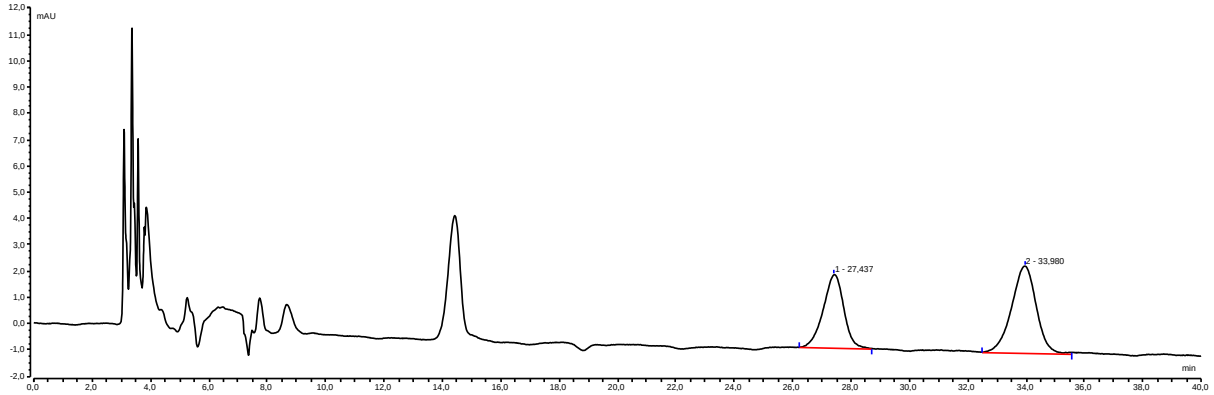
Peak Name	Retention Time	Rel.Area
	min	%
1	27,153	50,18
2	33,57	49,82

Indole [Chiralpak IA column, 100 bar, T = 20 °C, *n*-Heptane (+ 0.1% diethylamine)/EtOH (+ 0.1% diethylamine) = 97:3, 1 mL/min, λ = 300 nm, t_R = 14.877 min].



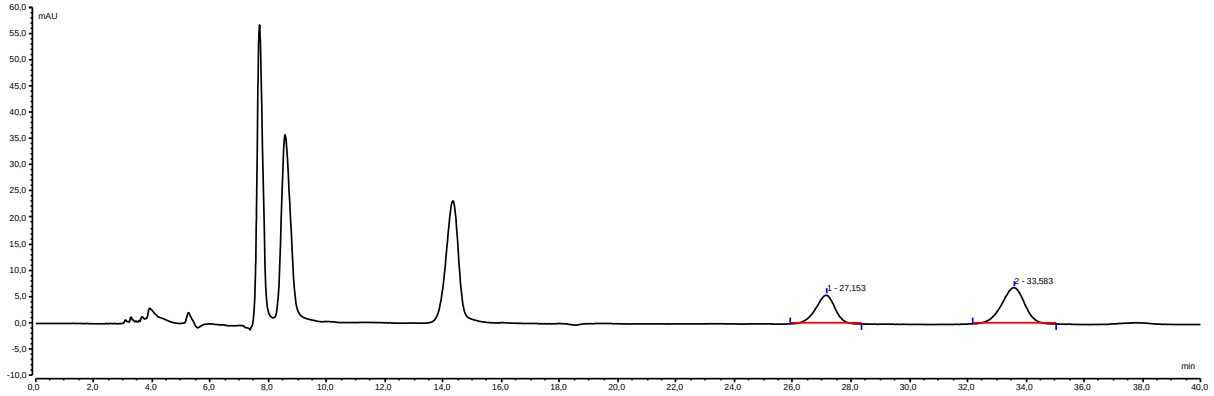
Peak Name	Retention Time	Rel.Area
	min	%
1	14,877	100

Following the general procedure A. HPLC analysis of the crude residue indicated a ratio indole/**18k** of 30:70 and an enantiomeric excess of (+) 16 [Chiralpak IA column, 100 bar, T = 20 °C, *n*-Heptane (+ 0.1% diethylamine)/EtOH (+ 0.1% diethylamine) = 97:3, 1 mL/min, λ = 300 nm, t_R = 27.437 min and t_R = 33.980 min].



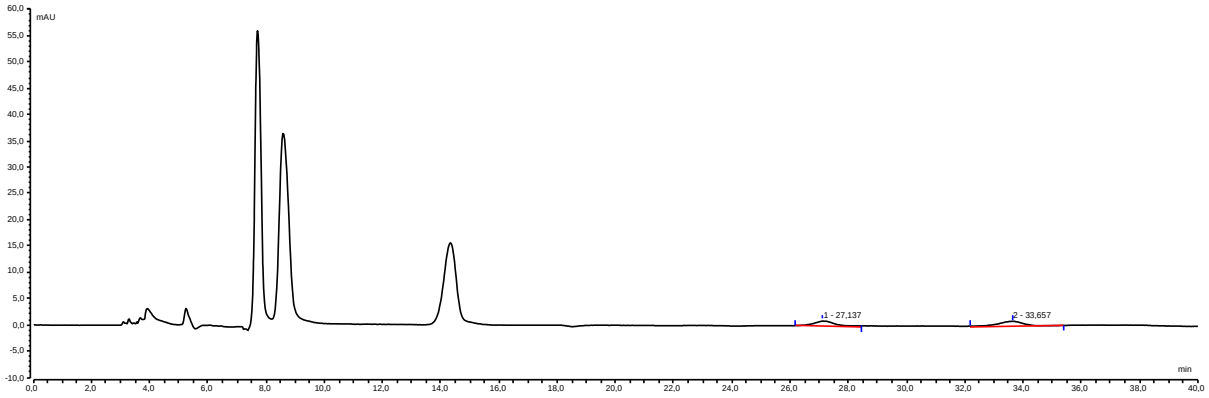
Peak Name	Retention Time	Rel.Area
	min	%
1	27,437	41,86
2	33,98	58,14

Following the general procedure B. HPLC analysis of the crude residue indicated a ratio indole/**18k** of 63:37 and an enantiomeric excess of (+) 20 [Chiralpak IA column, 100 bar, T = 20 °C, *n*-Heptane (+ 0.1% diethylamine)/EtOH (+ 0.1% diethylamine) = 97:3, 1 mL/min, λ = 300 nm, t_R = 27.153 min and t_R = 33.583 min].



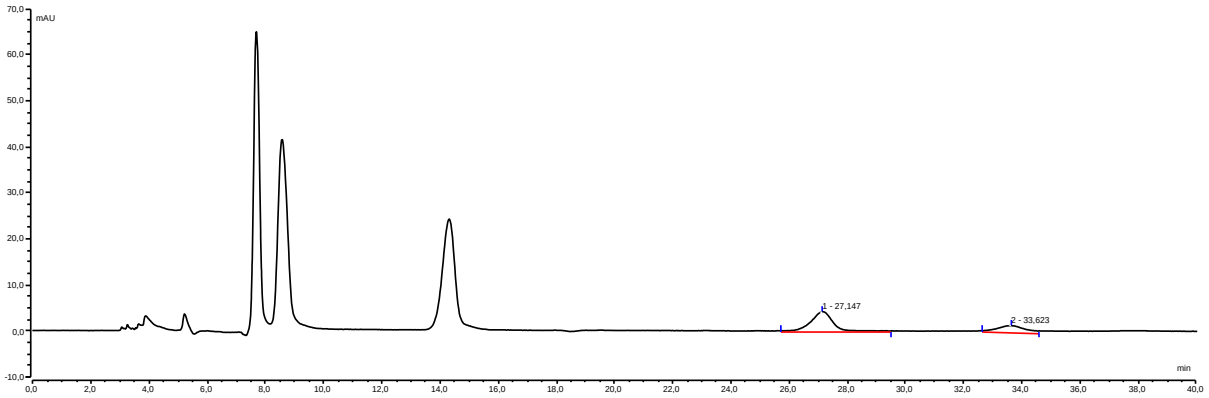
Peak Name	Retention Time	Rel.Area
	min	%
1	27,153	39,97
2	33,583	60,03

Following the general procedure C. HPLC analysis of the crude residue indicated a ratio indole/**18k** of 90:10 and an enantiomeric excess of (+) 11 [Chiralpak IA column, 100 bar, T = 20 °C, *n*-Heptane (+ 0.1% diethylamine)/EtOH (+ 0.1% diethylamine) = 97:3, 1 mL/min, λ = 300 nm, t_R = 27.137 min and t_R = 33.657 min].



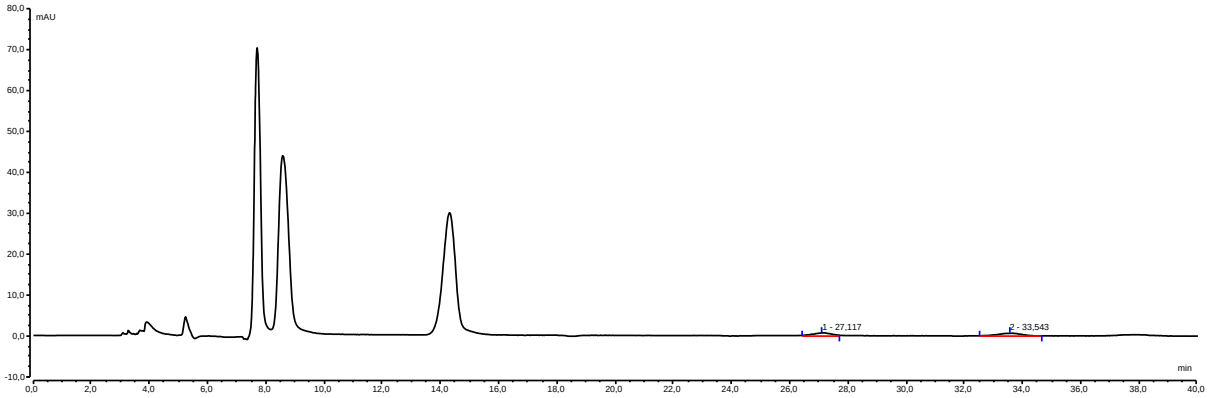
Peak Name	Retention Time	Rel.Area
	min	%
1	27,137	44,68
2	33,657	55,32

Following the general procedure D. HPLC analysis of the crude residue indicated a ratio indole/**18k** of 82:18 and an enantiomeric excess of (-) 54 [Chiralpak IA column, 100 bar, T = 20 °C, *n*-Heptane (+ 0.1% diethylamine)/EtOH (+ 0.1% diethylamine) = 97:3, 1 mL/min, λ = 300 nm, t_R = 27.147 min and t_R = 33.623 min].



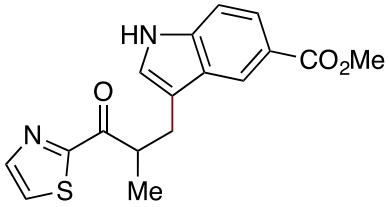
Peak Name	Retention Time	Rel.Area
	min	%
1	27,147	77,01
2	33,623	22,99

Following the general procedure E. HPLC analysis of the crude residue indicated a ratio indole/**18k** of 96:4 and an enantiomeric excess of (+) 19 [Chiralpak IA column, 100 bar, T = 20 °C, *n*-Heptane (+ 0.1% diethylamine)/EtOH (+ 0.1% diethylamine) = 97:3, 1 mL/min, λ = 300 nm, t_R = 27.117 min and t_R = 33.543 min].

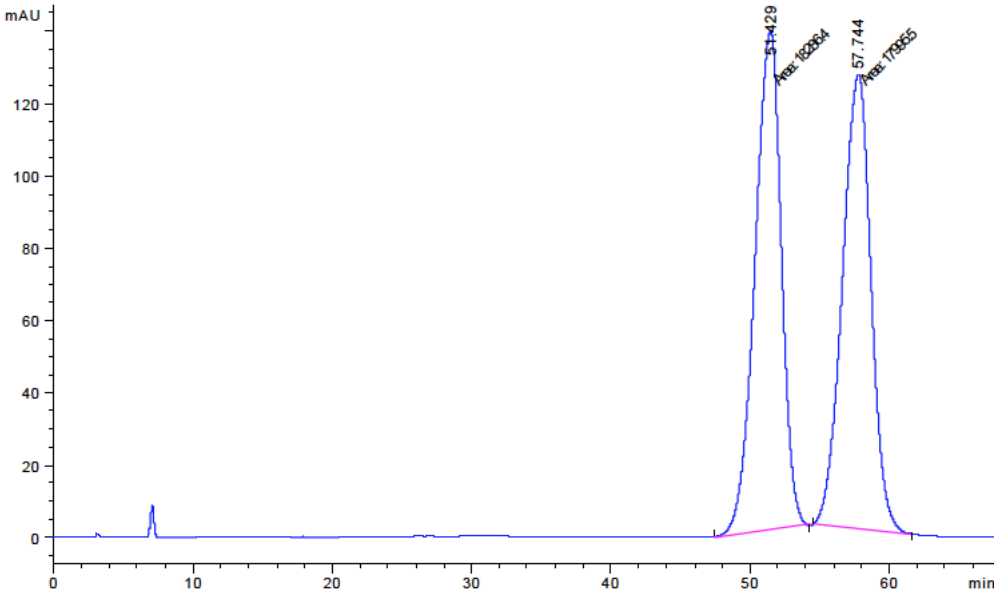


Peak Name	Retention Time	Rel.Area
	min	%
1	27,117	40,41
2	33,543	59,59

l. HPLC chromatograms of compound (18l)

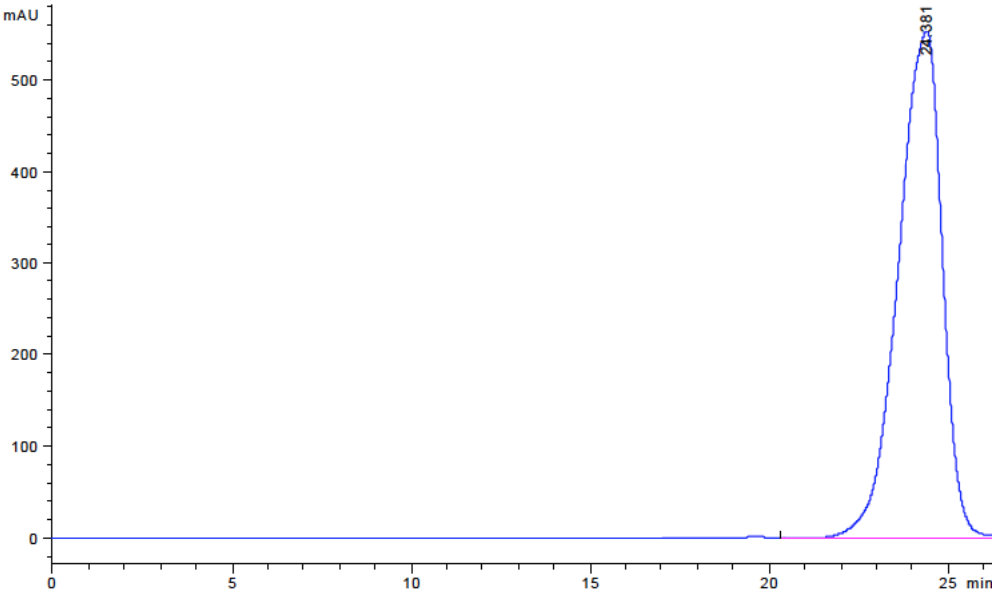


Racemic [Chiralpak IA column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 95:5, 1 mL/min, λ = 280 nm, t_R = 51.429 min and t_R = 57.744 min].

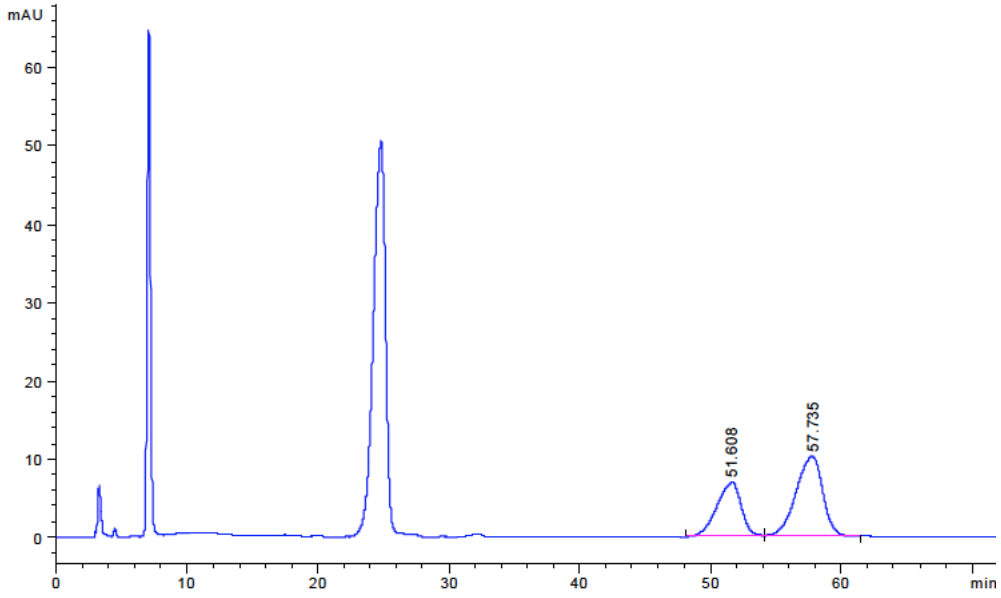


Peak	Retention Time	Rel. Area
	min	%
1	51.429	50.4008
2	57.744	49.5992

Indole [Chiralpak IA column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 95:5, 1 mL/min, λ = 280 nm, t_R = 24.381 min].

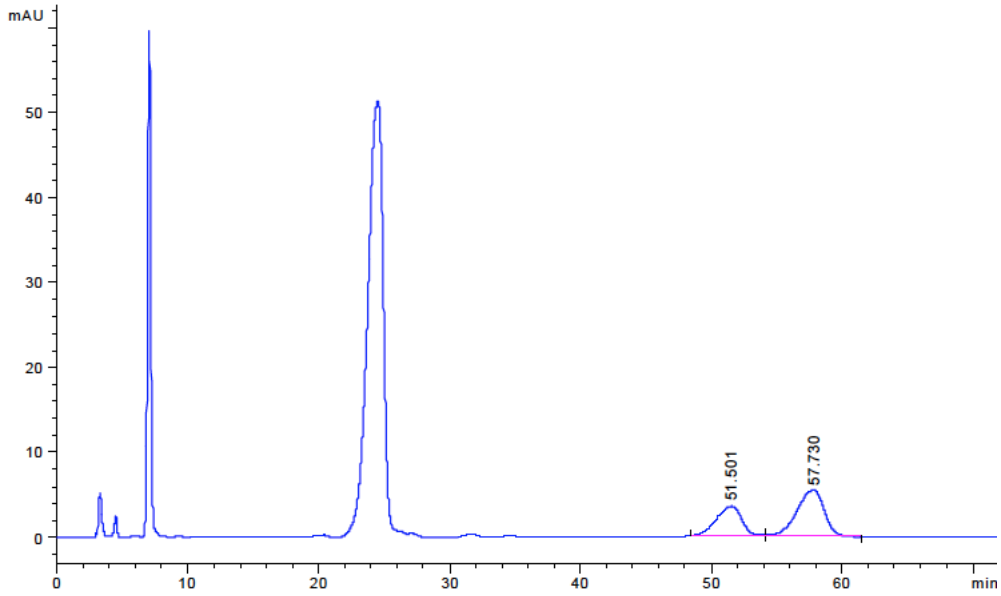


Following the general procedure A. HPLC analysis of the crude residue indicated a ratio indole/**18l** of 57:43 and an enantiomeric excess of (+) 23 [Chiralpak IA column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 95:5, 1 mL/min, λ = 280 nm, t_R = 51.608 min and t_R = 57.735 min].



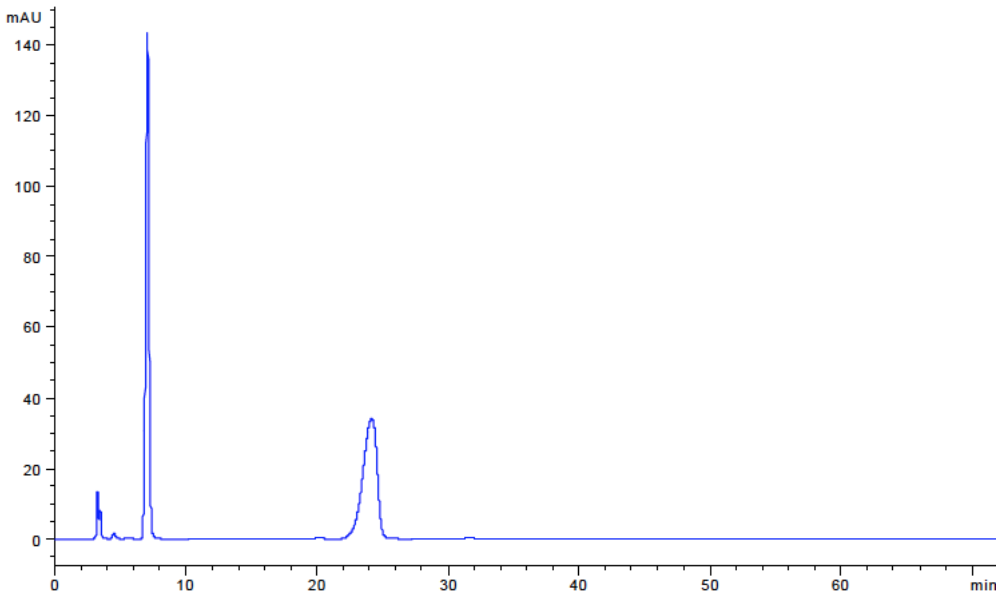
Peak	Retention Time	Rel. Area
	min	%
1	51.608	38.7279
2	57.735	61.2721

Following the general procedure B. HPLC analysis of the crude residue indicated a ratio indole/**18l** of 76:24 and an enantiomeric excess of (+) 24 [Chiralpak IA column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 95:5, 1 mL/min, λ = 280 nm, t_R = 51.501 min and t_R = 57.730 min].

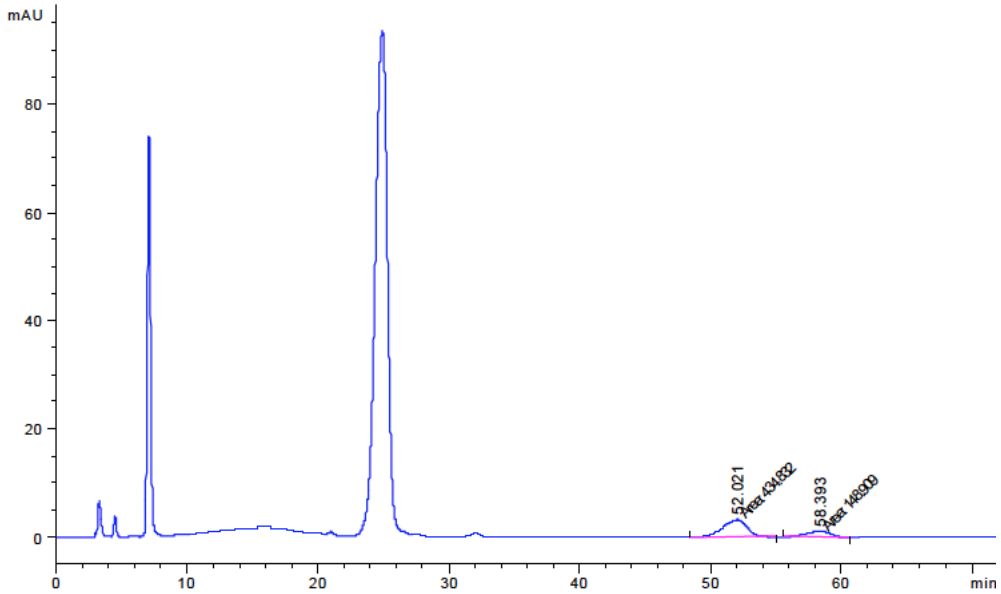


Peak	Retention Time	Rel. Area
	min	%
1	51.501	38.1842
2	57.73	61.8158

Following the general procedure C. HPLC analysis of the crude residue did not detect any product [Chiralpak IA column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 95:5, 1 mL/min, λ = 280 nm].

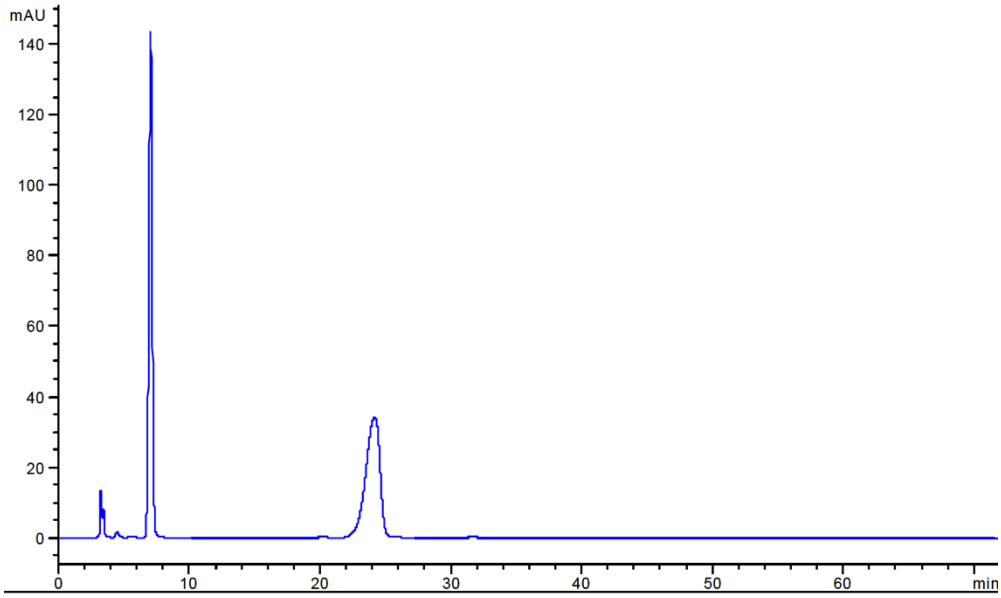


Following the general procedure D. HPLC analysis of the crude residue indicated a ratio indole/**18l** of 91:9 and an enantiomeric excess of (-) 49 [Chiralpak IA column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 95:5, 1 mL/min, λ = 280 nm, t_R = 52.021 min and t_R = 58.393 min].

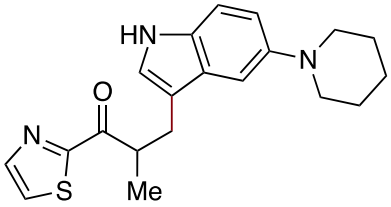


Peak	Retention Time	Rel. Area
	min	%
1	52.021	74.4905
2	58.393	25.5095

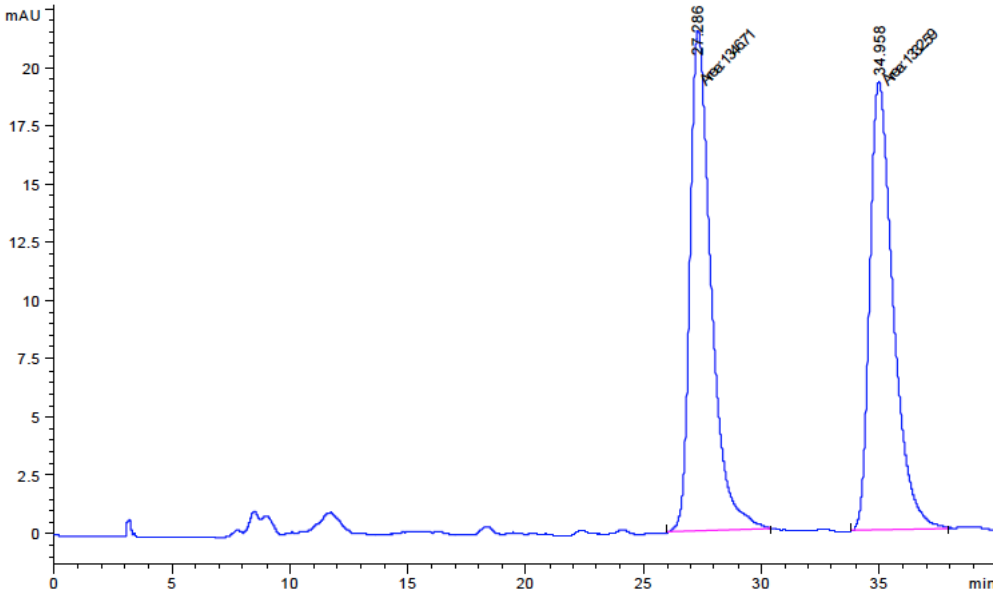
Following the general procedure E. HPLC analysis of the crude residue did not detect any product [Chiralpak IA column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 95:5, 1 mL/min, λ = 280 nm].



m. HPLC chromatograms of compound (18m)

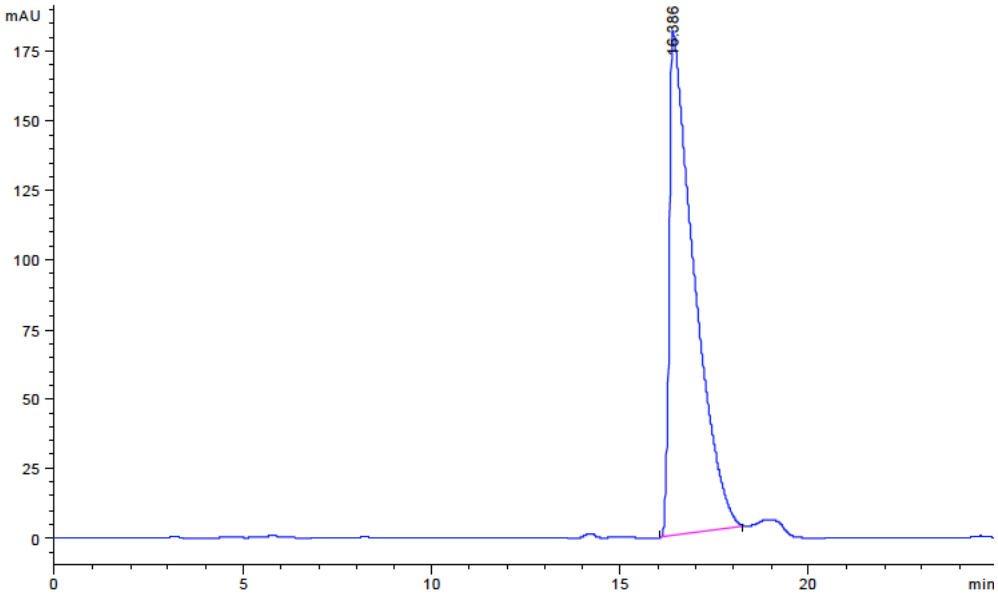


Racemic [Chiralpak IB column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 92:8, 1 mL/min, λ = 300 nm, t_R = 27.286 min and t_R = 34.958 min].

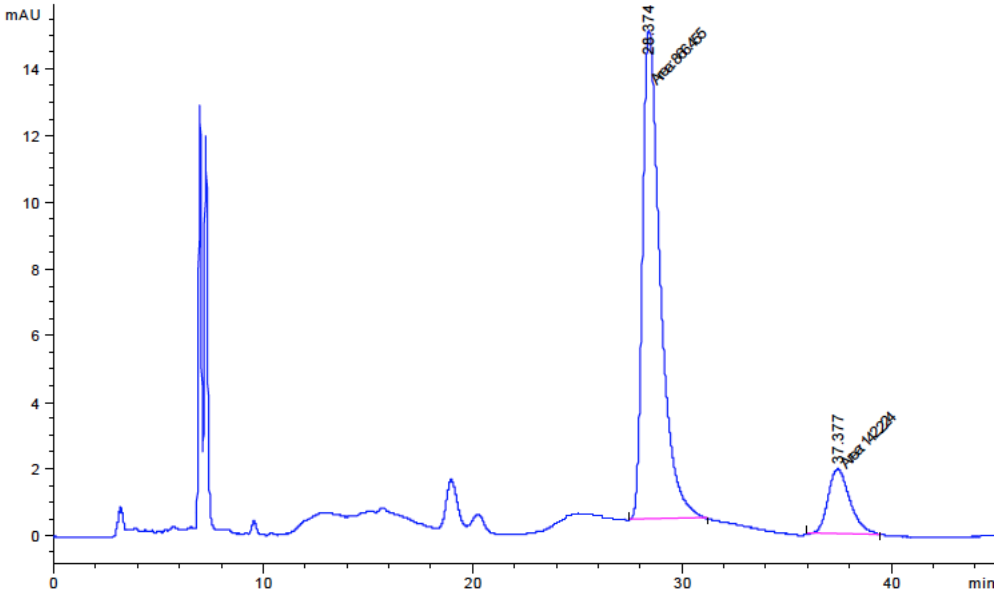


Peak	Retention Time	Rel. Area
	min	%
1	27.286	50.2633
2	34.958	49.7367

Indole [Chiralpak IA column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 90:10, 1 mL/min, λ = 300 nm, t_R = 16.386 min].

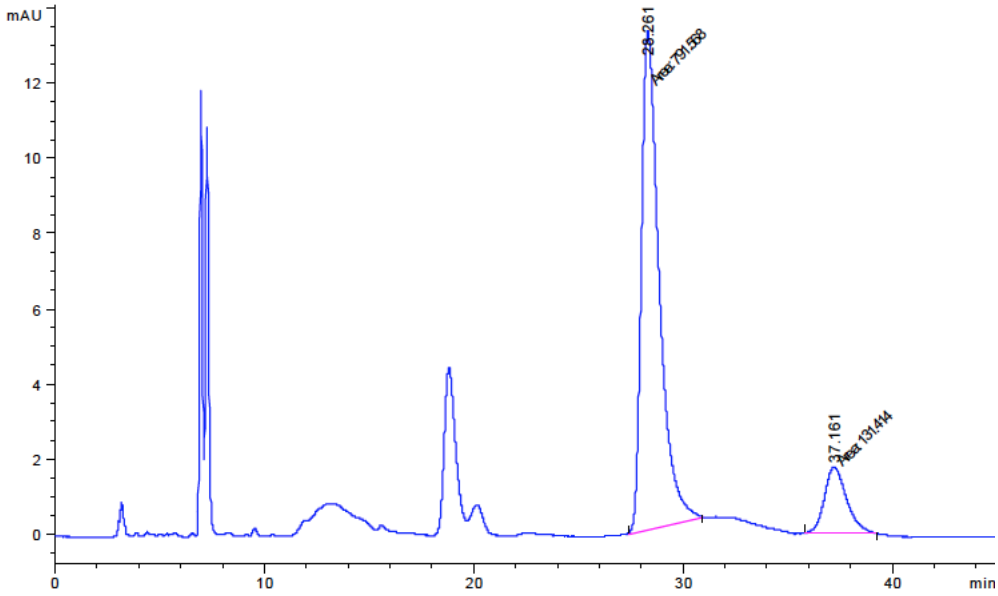


Following the general procedure A. HPLC analysis of the crude residue indicated a ratio indole/**18m** of 5:95 and an enantiomeric excess of (+) 72 [Chiralpak IB column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 92:8, 1 mL/min, λ = 300 nm, t_R = 28.374 min and t_R = 37.377 min].



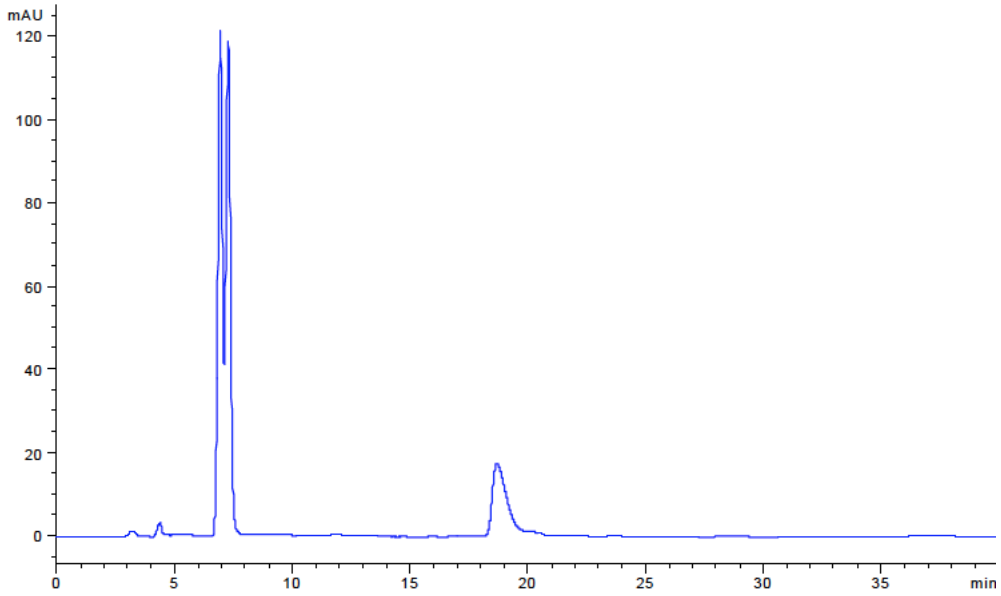
Peak	Retention Time	Rel. Area
	min	%
1	28.374	85.8999
2	37.377	14.1001

Following the general procedure B. HPLC analysis of the crude residue indicated a ratio indole/**18m** of 16:84 and an enantiomeric excess of (+) 72 [Chiralpak IB column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 92:8, 1 mL/min, λ = 300 nm, t_R = 28.261 min and t_R = 37.161 min].

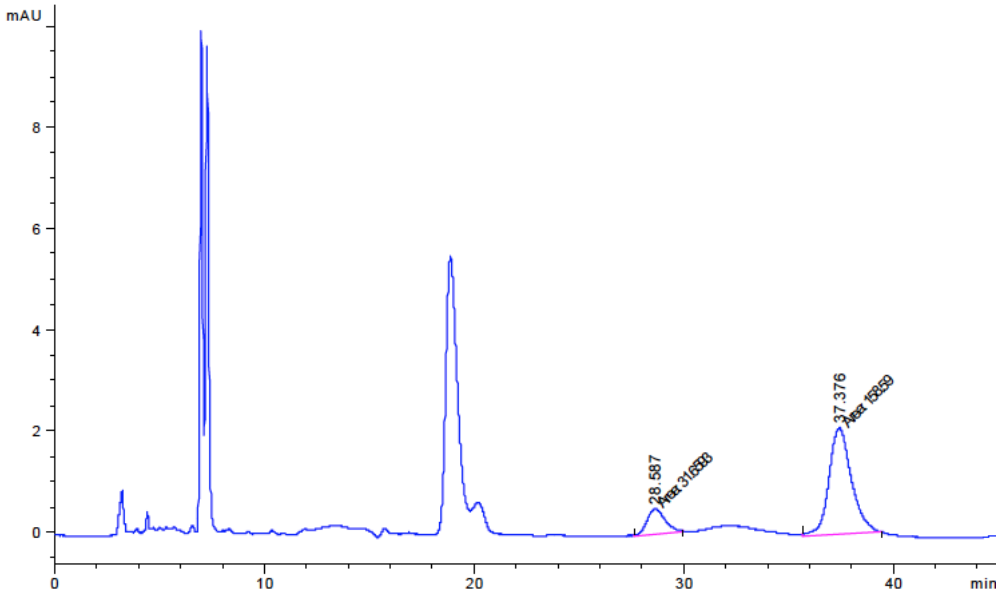


Peak	Retention Time	Rel. Area
	min	%
1	28.261	85.762
2	37.161	14.238

Following the general procedure C. HPLC analysis of the crude residue did not detect any product [Chiralpak IB column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 92:8, 1 mL/min, λ = 300 nm].

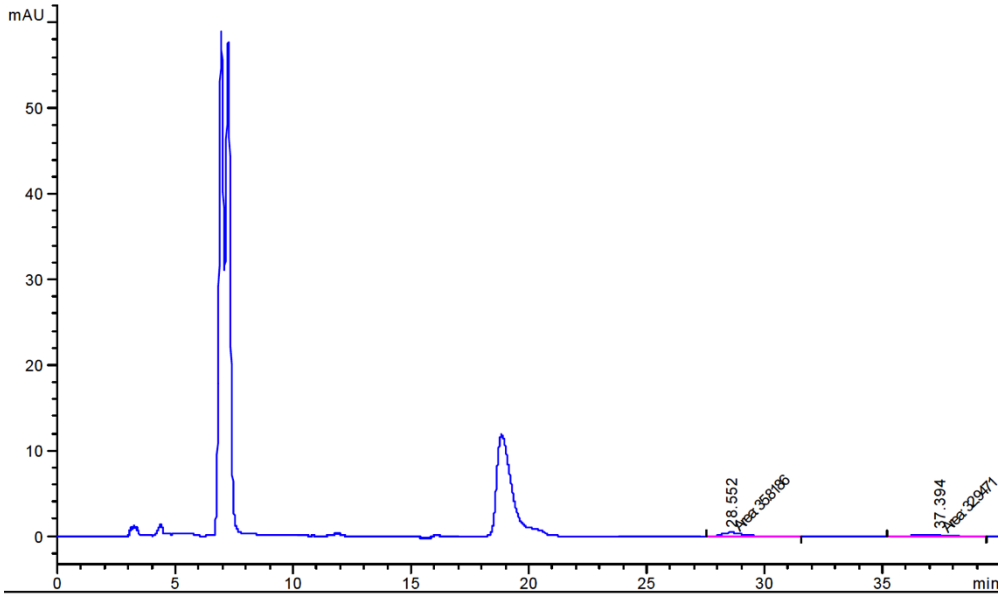


Following the general procedure D. HPLC analysis of the crude residue indicated a ratio indole/**18m** of 53:47 and an enantiomeric excess of (-) 67 [Chiralpak IB column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 92:8, 1 mL/min, λ = 300 nm, t_R = 28.587 min and t_R = 37.376 min].



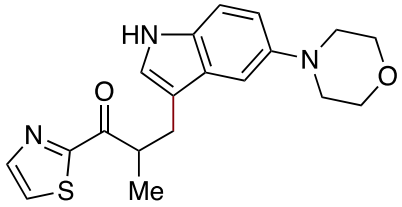
Peak	Retention Time	Rel. Area
	min	%
1	28.587	16.6409
2	37.376	83.3591

Following the general procedure E. HPLC analysis of the crude residue detected traces of **18m** and an enantiomeric excess of (+) 4 [Chiralpak IB column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 92:8, 1 mL/min, λ = 300 nm, t_R = 28.552 min and t_R = 37.394 min].

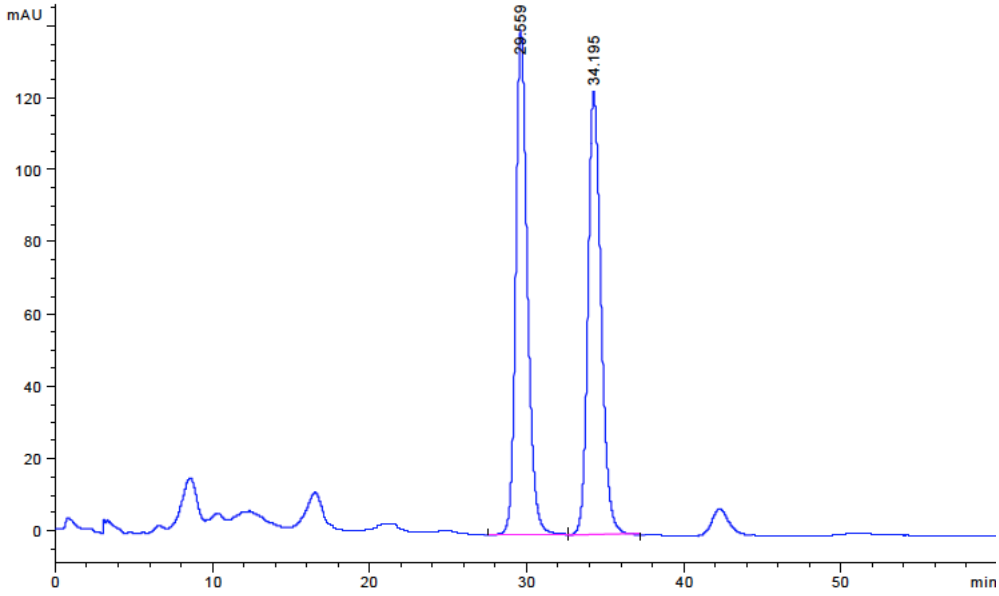


Peak	Retention Time	Rel. Area
	min	%
1	28.552	52.0879
2	37.394	47.9121

n. HPLC chromatograms of compound (18n)

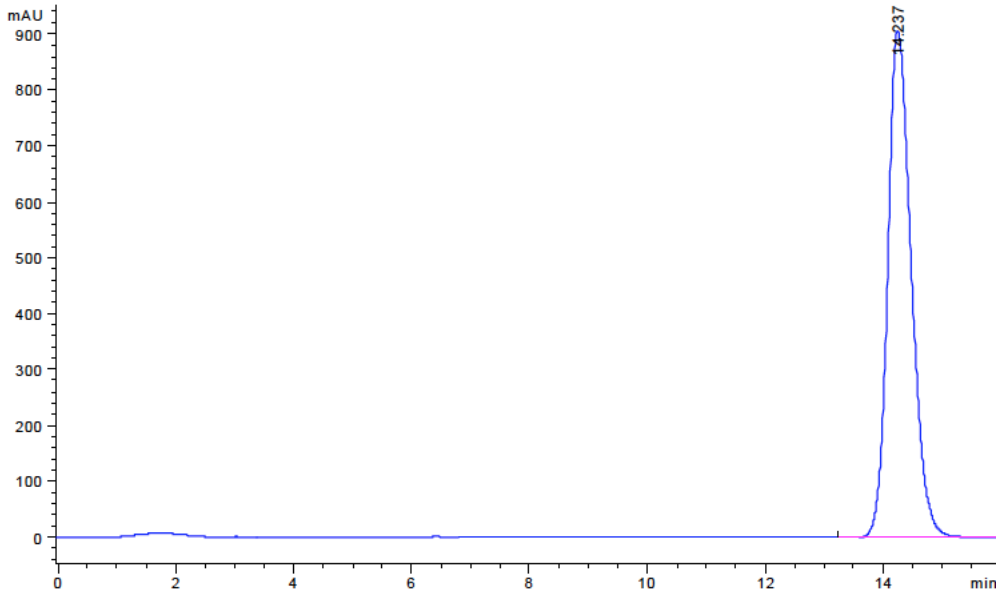


Racemic [Chiralpak IA column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 90:10, 1 mL/min, λ = 280 nm, t_R = 29.559 min and t_R = 34.195 min].

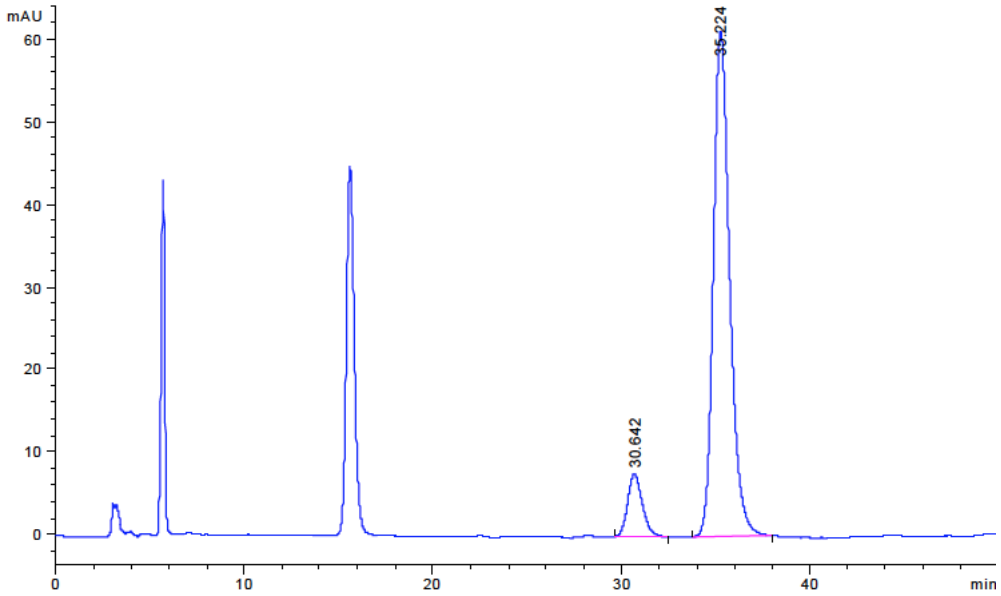


Peak	Retention Time	Rel. Area
	min	%
1	29.559	50.329
2	34.195	49.671

Indole [Chiralpak IA column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 90:10, 1 mL/min, λ = 280 nm, t_R = 14.237 min].

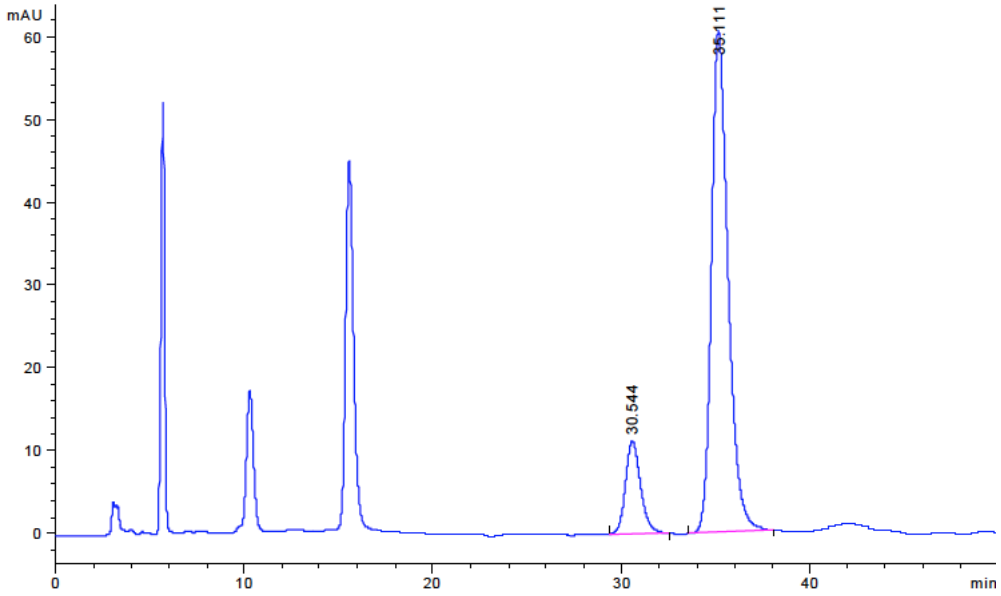


Following the general procedure A. HPLC analysis of the crude residue indicated a ratio indole/**18n** of 24:76 and an enantiomeric excess of (+) 79 [Chiralpak IA column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 90:10, 1 mL/min, λ = 280 nm, t_R = 30.642 min and t_R = 35.224 min].



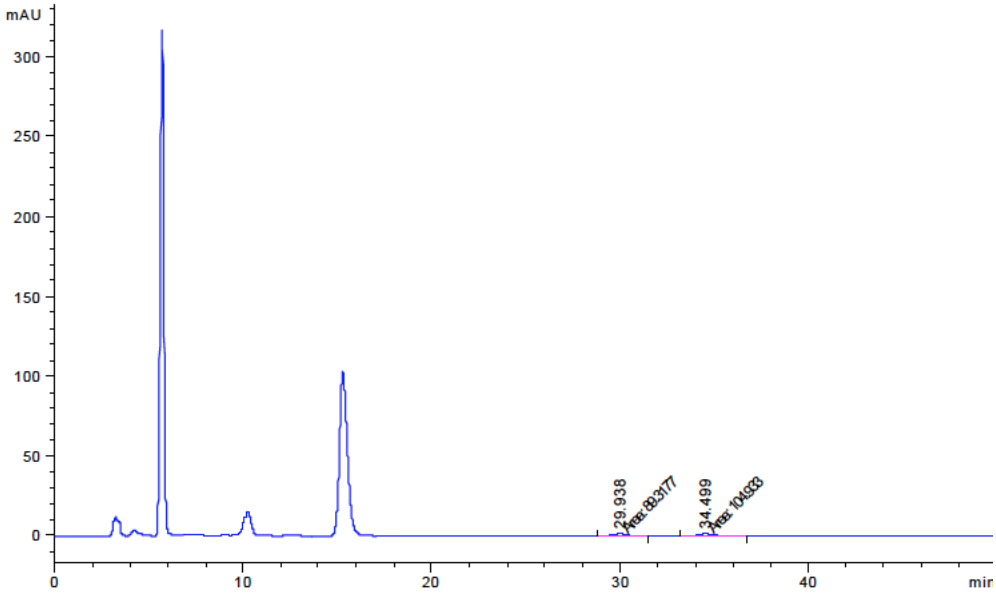
Peak	Retention Time	Rel. Area
	min	%
1	30.642	10.2967
2	35.224	89.7033

Following the general procedure B. HPLC analysis of the crude residue indicated a ratio indole/**18n** of 23:77 and an enantiomeric excess of (+) 71 [Chiralpak IA column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 90:10, 1 mL/min, λ = 280 nm, t_R = 30.544 min and t_R = 35.111 min].



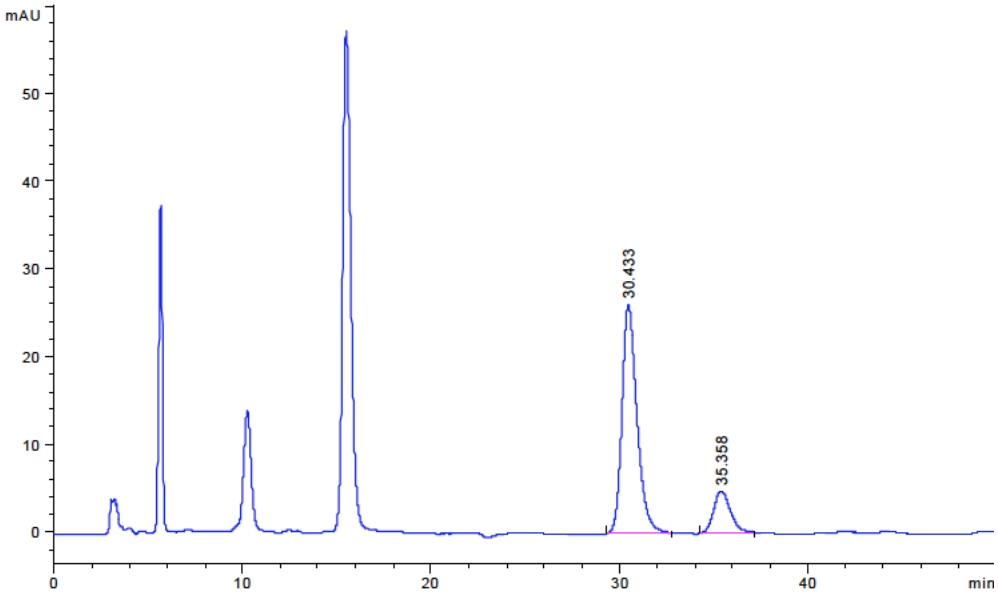
Peak	Retention Time	Rel. Area
	min	%
1	30.544	14.619
2	35.111	85.381

Following the general procedure C. HPLC analysis of the crude residue indicated a ratio indole/**18n** of 94:6 and an enantiomeric excess of (+) 8 [Chiralpak IA column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 90:10, 1 mL/min, λ = 280 nm, t_R = 29.938 min and t_R = 34.499 min].



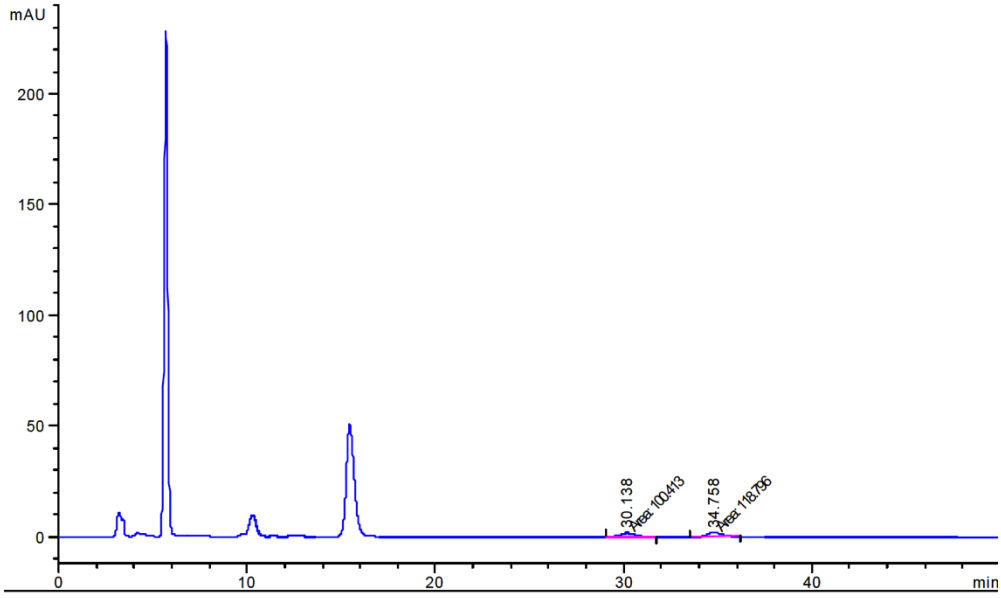
Peak	Retention Time	Rel. Area
	min	%
1	29.938	45.9806
2	34.499	54.0194

Following the general procedure D. HPLC analysis of the crude residue indicated a ratio indole/**18n** of 50:50 and an enantiomeric excess of (-) 65 [Chiralpak IA column, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 90:10, 1 mL/min, λ = 280 nm, t_R = 30.433 min and t_R = 35.358 min].



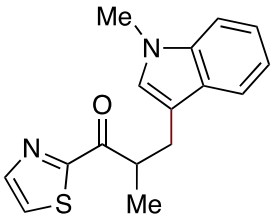
Peak	Retention Time	Rel. Area
	min	%
1	30.433	82.725
2	35.358	17.275

Following the general procedure E. HPLC analysis of the crude residue indicated a ratio indole/**18n** of 87:13 and an enantiomeric excess of (+) 8 [Chiralpak IA, 250 bar, T = 30 °C, *n*-Hexane/*i*-PrOH = 90:10, 1 mL/min, λ = 280 nm, t_R = 30.138 min and t_R = 34.758 min].

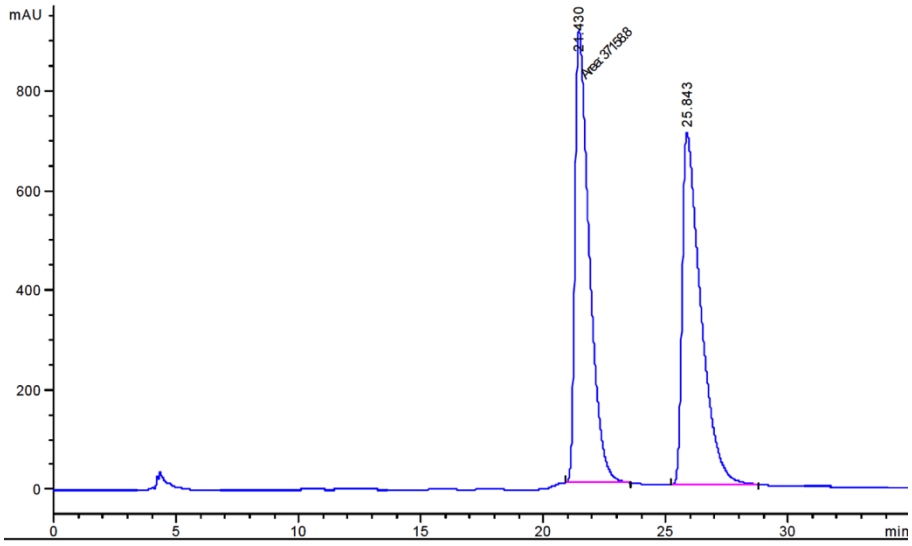


Peak	Retention Time	Rel. Area
	min	%
1	30.138	45.8069
2	34.758	54.1931

o. HPLC chromatograms of compound (18o)

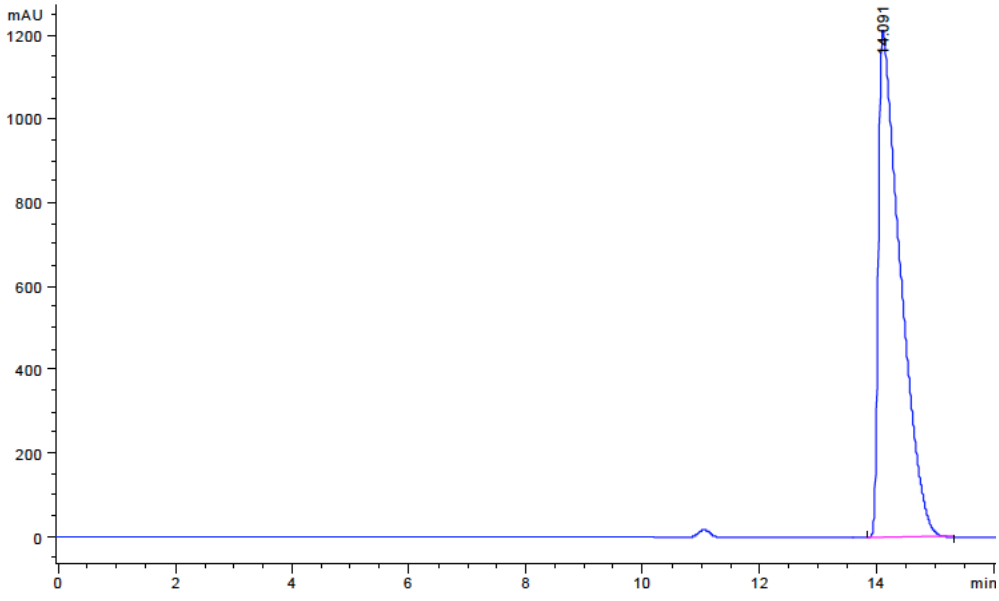


Racemic [Chiralpak IB column, 250 bar, T = 15 °C, *n*-Hexane/*i*-PrOH = 98:2, 0.8 mL/min, λ = 230 nm, t_R = 21.430 min and t_R = 25.843 min].

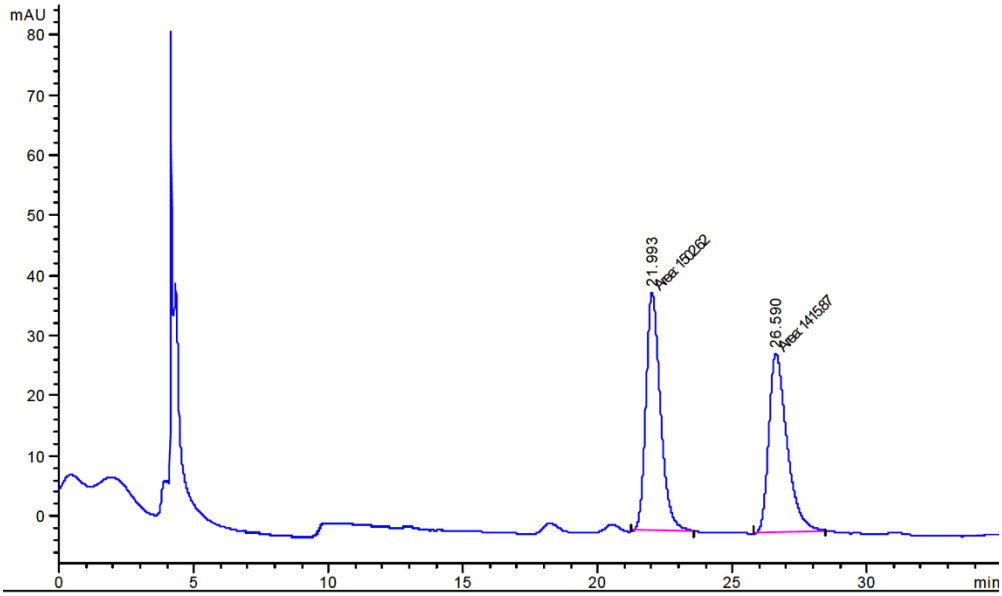


Peak	Retention Time	Rel. Area
	min	%
1	21.43	49.9162
2	25.843	50.0838

Indole [Chiralpak IB column, 250 bar, T = 15 °C, *n*-Hexane/*i*-PrOH = 98:2, 0.8 mL/min, λ = 230 nm, t_R = 14.091].

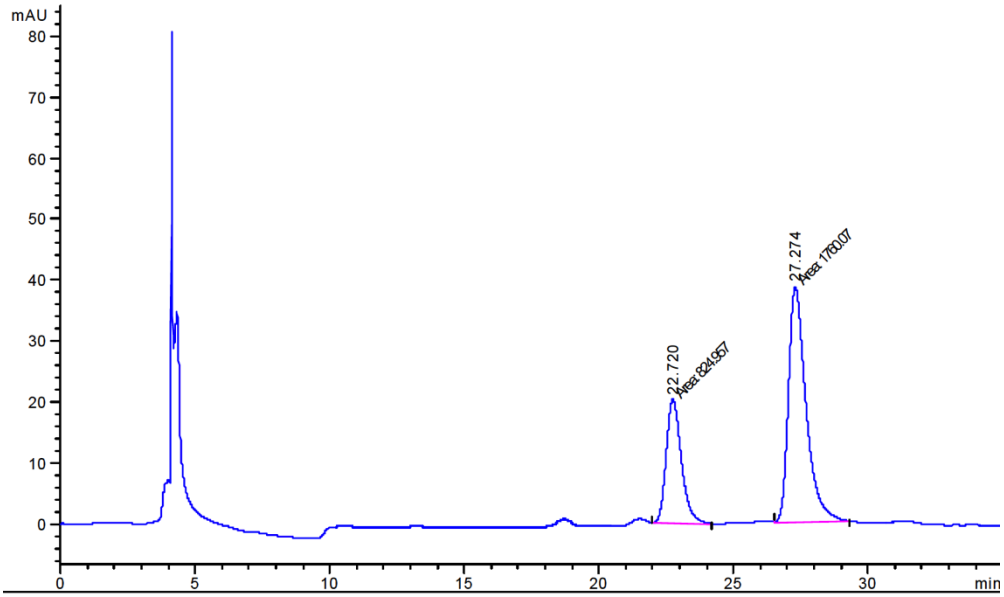


Following the general procedure A. HPLC analysis of the crude residue indicated a ratio indole/**18o** of > 1:99 and an enantiomeric excess of (+) 3 [Chiralpak IB column, 250 bar, T = 15 °C, *n*-Hexane/*i*-PrOH = 98:2, 0.8 mL/min, λ = 230 nm, t_R = 21.993 min and t_R = 26.590 min].



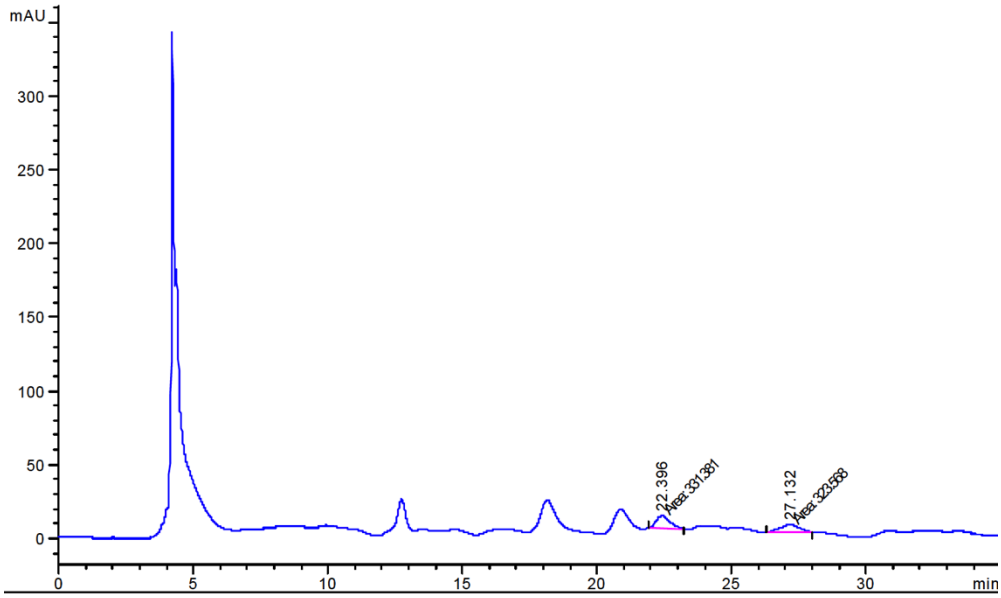
Peak	Retention Time	Rel. Area
	min	%
1	21.993	51.4863
2	26.59	48.5137

Following the general procedure B. HPLC analysis of the crude residue indicated a ratio indole/**18o** of > 1:99 and an enantiomeric excess of (-) 36 [Chiralpak IB column, 250 bar, T = 15 °C, *n*-Hexane/*i*-PrOH = 98:2, 0.8 mL/min, λ = 230 nm, t_R = 22.720 min and t_R = 27.274 min].



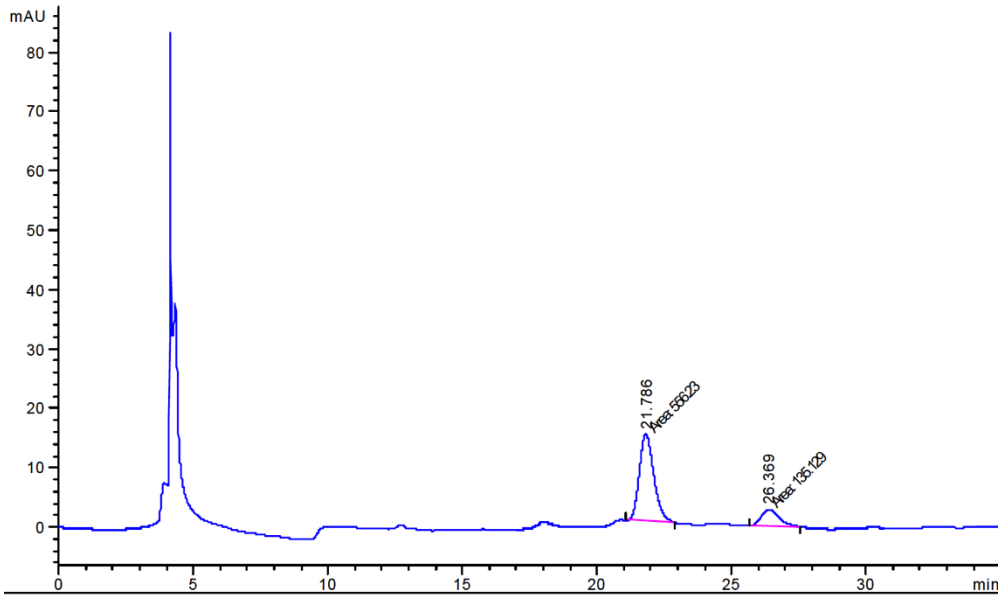
Peak	Retention Time	Rel. Area
	min	%
1	22.72	31.9129
2	27.274	68.0871

Following the general procedure C. HPLC analysis of the crude residue detected traces of **18o** and an enantiomeric excess of 0 [Chiralpak IB column, 250 bar, T = 15 °C, *n*-Hexane/*i*-PrOH = 98:2, 0.8 mL/min, λ = 230 nm, t_R = 22.396 min and t_R = 27.132 min]. *Presence of by-products.*



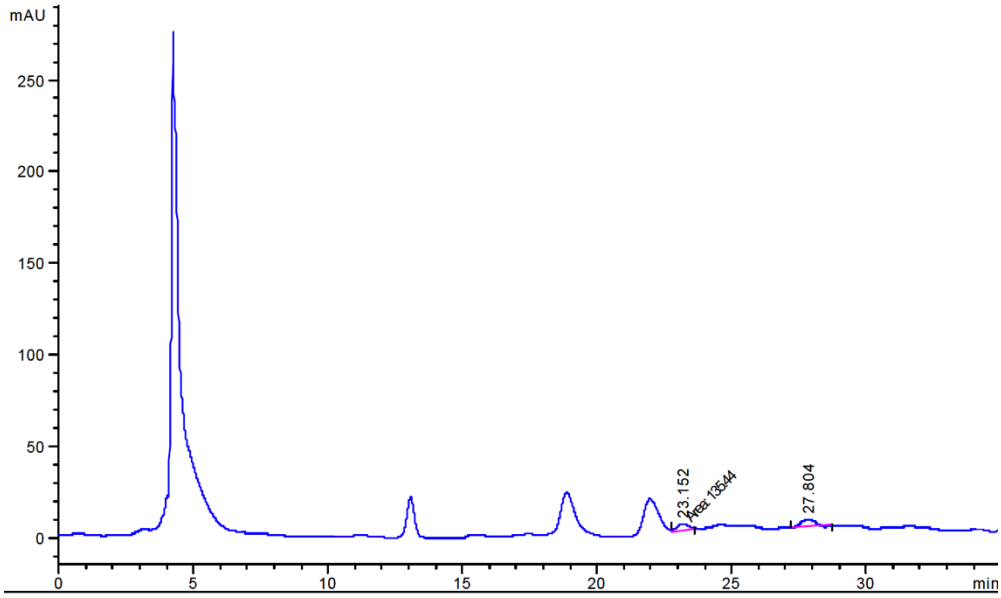
Peak	Retention Time	Rel. Area
	min	%
1	22.396	50.5964
2	27.132	49.4036

Following the general procedure D. HPLC analysis of the crude residue indicated a ratio indole/**18o** of > 1:99 and an enantiomeric excess of (+) 61 [Chiralpak IB column, 250 bar, T = 15 °C, *n*-Hexane/*i*-PrOH = 98:2, 0.8 mL/min, λ = 230 nm, t_R = 21.786 min and t_R = 26.369 min].



Peak	Retention Time	Rel. Area
	min	%
1	21.786	80.4546
2	26.369	19.5454

Following the general procedure E. HPLC analysis of the crude residue detected traces of **18o** and an enantiomeric excess of (-) 4 [Chiralpak IB column, 250 bar, T = 15 °C, *n*-Hexane/*i*-PrOH = 98:2, 0.8 mL/min, λ = 230 nm, t_R = 23.152 min and t_R = 27.804 min]. *Presence of by-products.*



Peak	Retention Time	Rel. Area
	min	%
1	23.152	47.8492
2	27.804	52.1508

References

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